The Newspaper of Information Systems Management
January 8, 1996, Vol. 30, No. 2, 114 Pages, $6/Copy, $48/Year

COMPUTERWORLD

No more networking nice guys

Managers fed up with vendor shortcomings, excuses

By Laura DiDio and Bob Wallace

Vendors take heed: Don't mess with John Scoggin — or with Thad Hymel or Brad Errington.

They are among the growing ranks of information systems managers who are fighting back when confronted with unreliable products, broken vendor promises or bait-and-switch deals on pricing and support.

Computerworld interviews with several irate network managers in recent weeks point to a trend of tougher, swifter user action in response to vendor shortcomings.

Behind this trend are the facts of life in a maturing networking market: a new generation of technically savvy IS managers, technology standardization and a wider array of product choices.

"That all adds up to users no longer [having] to tolerate vendors' broken promises or products that don't work. They simply call one of the many suppliers until they find the deal that suits them," said Charles Robbins, an analyst at Aberdeen Group, Inc., a consultancy in Boston.

The impact on their businesses' bottom line also is propelling users toward decisive action. Ten years ago, problems with individual computer and network components

Irate users, *page 29*

User issues

Continued switching delays perplex Bay customers

By Laura DiDio and Bob Wallace

Bay Networks, Inc. executives have once again revised their shipping schedule for the long-delayed System 5000 segment switching modules. Originally slated for release in late 1993, the first of the modules for Bay Networks' flagship high-end switch is now supposed to ship sometime in the second quarter.

"Switching isn't an issue right now for the majority of Bay's customers, who don't really need it," said Jim Hourihan, Bay Networks' vice president of marketing.

But analysts and some users beg to differ.

Customers have been waiting for Bay Networks' LAN segment switching modules to give them increased dedicated bandwidth and faster throughput to eliminate network bottlenecks. Right now, the System 5000 is a powerful high-end hub, but without the switching modules, it can't act as a true LAN segment switch.

One disappointed Bay user is BHP Slab and Plate in Sydney, the largest international steel manufacturing company in Australia.

Last September, BHP pulled out of final negotiations to buy more than $2 million worth of the System 5000 switching hubs after Billerica, Mass.-based Bay was unable

Late products, *page 29*

Finding a cure for E-mail pains

Users say convenience, not price, drives search for E-mail outsourcers

By Suruchi Mohan

In the lean and mean organizations of the '90s, saving money isn't the only motivation for outsourcing. Sometimes sheer convenience is the driving factor.

At least that's what information systems managers at some companies say about their decision to outsource their electronic-mail operations: The result is no pain, all gain.

Just ask Tom Johnson, manager of software technologies at The Trane Co. in La Crosse, Wis. A year ago, Johnson employed Wiltek, Inc. in Norwalk, Conn., to connect and synchronize his host- and LAN-based E-mail.

Potential cost savings didn't drive the decision as much as the prospect of "no headaches" with the outsourcing option, Johnson said. Also appealing was the ability to focus resources on other tasks, such as migrating users from the host-based systems to Microsoft Corp.'s Mail.

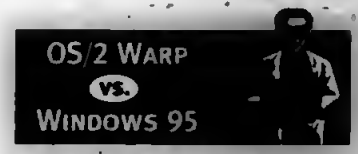
Bruce Boyle, a manager of information technology for commercial aviation systems at Honeywell, Inc. in Phoenix, is sitting on the proverbial fence, pondering his division's situation.

Should he decide to outsource the management of his E-mail operation by the second half of the year, "cost won't be the issue. The main goal would be to pull the administrative functions together," he explained. Right now, several people manage mail on a part-time basis at Honeywell; outsourcing would free up their time.

Savings from E-mail outsourcing are hard to quantify because most of the costs are associated with maintenance, not initial setup, said Gary Rowe, a principal at Rapport Communication in

E-mail outsourcing, *page 99*

Newspaper



In the battle between Microsoft's Windows 95 and IBM's OS/2 Warp, hands-on testing by an independent lab for *Computerworld* shows there is no obvious winner for all users. In performance tests, only minimal differences surfaced between the two operating systems. See our complete review on pages 44 and 46.

INSIDE

- IBM will be integrating Notes 4.0 with its MQSeries messaging middleware. **See story, page 4, by Craig Stedman.**
- After a notable 1995 turnaround, Digital has reinvigorated its strategy. **See story, page 8, by Michael Goldberg.**
- MacIS, Apple's premier user group, has shut down and left users wondering about Apple's commitment to the corporate market. **See story, page 12, by Lisa Picarille.**
- Intel will roll back chip prices as it adds the 150- and 166-MHz Pentium processors to its lineup. **See story, page 16, by Jaikumar Vijayan.**

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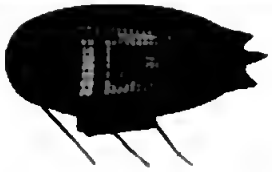

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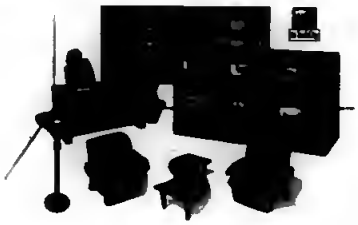

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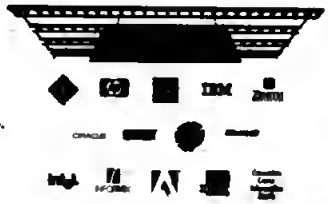

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Inside Computerworld

Jan. 8, 1996

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The advent of "intranet" technologies may make some companies shy away from groupware and dedicated E-mail packages.

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OS/2 Warp Server, despite its reputation for having a foot in the grave, should be considered on its technical merits, Charles Babcock says.

Choice Cuts

Preboard Boeing's 777, *the first 100% digitally designed airplane, and read about the role of IS.* **Managing, page 70**

At a local level, *managers are beginning to gain at least a temporary grip on the storage management problem.* **Servers & PCs, page 39**

Closer Look
STORAGE MANAGEMENT

Though ISDN is hyped *as a prime-time data service, the reality is that it still has several hurdles to clear.* **The Enterprise Network, page 53**

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altcw

Tired of boring beige? Sys-LAN in Burnsville, Minn., claims to be the only U.S. firm selling colored desktop PCs, laptops and monitors. You can also get your Colorware workstation upholstered in fabric or leather or emblazon it with the company's corporate logo. The vendor even cites studies that claim colorful offices boost morale and can hike productivity as much as 10% to 15%.

Pharmacia & Upjohn in Kalamazoo, Mich., last month opened an Internet site "to raise awareness and understanding about male impotence." You can visit the site at http://www.impotent.com.

A spell-checking program changed "biotech" to "batik" in an entire chapter of the book *The World of 2044*.

A spell checker at a Boston-area magazine substituted ACLJ for ACLU in an April 1994 article. The ACLJ is the American Center for Law and Justice, which is affiliated with the Rev. Pat Robertson and politically far apart from the American Civil Liberties Union.

A Marshall Field's press release in December 1994 said the Chicago retailer would serve hot chocolate to "tiresome" shoppers instead of "tired" shoppers. The error was blamed on a spell-checking program.

Compiled from Usenet's comp.society.folklore

- The Internet has a single governing body and headquarters.
- The Internet is totally secure.
- The Internet is totally insecure.
- Proper spelling and grammar are unnecessary.
- An invisible user isn't human and deserves to be flamed.
- Usenet equals Internet, and Internet equals Usenet.

More federal agencies are getting into software publishing. The Federal Reserve, the Occupational Safety and Health Administration (OSHA) and the Patent and Trademark Office have each announced freeware or shareware packages. The Federal Reserve offers a free Windows program called Partners, which helps banks determine within seconds if potential home buyers can qualify for a home purchase loan. OSHA has a $28 Windows package called Asbestos Advisor to help building owners and contractors comply with asbestos regulations. The patent office offers Mimosa, standardized software for searching CD-ROM databases of U.S., European and Japanese patents.

■ Send contributions of off-beat news, lists and anecdotes to mbetts@cw.com.

Forget the year 2000 date conversion concerns. Here at CW, our systems couldn't even handle the move to 1996. Files created after the New Year were date-stamped "1980," harking back to the days of the Tandy and disco dancing. Imagine the surprise of our writers, who saw stories they'd filed late showing up 16 years early.

Digital Frontiers

Driving a cab is one of America's most dangerous occupations, but drivers can reduce their risk of being assaulted by using vehicle-tracking devices, cashless fare systems and other new technologies, according to researchers at North Carolina State University in Raleigh.

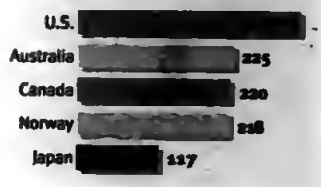
A survey of cab fleet company owners gave high marks to cashless fare systems, such as are used in Denver in which customers pay fares with prepaid debit cards.

"When you have no money changing hands, you eliminate the incentive for robbery," says researcher John R. Stone. Robbery was the motivating factor in more than 75% of the assaults and 100% of the homicides, the survey found.

Another safety option rated highly by cab company owners was automatic vehicle location systems, which use satellite and ground-based technology to track a cab and relay its movements to dispatchers. The systems are being tested in Chicago.

— *Mitch Betts*

Countries with the most computers per 1,000 people



Source: *Computer Industry Almanac*, Glenbrook, Nev.

factoid of the week

Of the public libraries serving populations of 100,000 or more, 23% provide direct public access to the Internet and 70% provide commercial database searches with staff assistance. Nearly 90% have an on-line public catalog, and 70% allow homes and businesses to access the catalog via modem.

Source: American Library Association, Chicago

Vendors draft fix to control, boost WAN performance

By Bob Wallace

Eight top networking vendors last week spelled out a new way for user equipment to add or drop dial-up and ISDN lines as bandwidth needs fluctuate.

The group submitted a draft specification to the Internet Engineering Task Force (IETF). The vendors leading the effort are remote access product giants Shiva Corp. and Ascend Communications Corp. Also involved are Microsoft Corp., Cisco Systems, Inc., Bay Networks, Inc., 3Com Corp., U.S. Robotics, Inc. and Xylogics, Inc.

The protocol in the specification is the Bandwidth Allocation Protocol (BACP). It promises to boost performance by calling up additional wide-area network connections and save money by using that bandwidth only when it is needed.

Excitement in the air

Analysts are enthusiastic about BACP. "It sounds like a can't-lose situation for users whether they're accessing corporate networks, the Internet or on-line services," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J. "And it could be a real shot in the arm for telecommuting."

Remote sites and telecommuters use dial-up or Integrated Services Digital Network (ISDN) lines to access corporate networks. The IETF is working on the Multilink Point-to-Point Protocol (PPP) specification, which lets devices combine the two 64K bit/sec. B channels on an ISDN line to form a 128K bit/sec. connection.

But with Multilink PPP, the B channels stay up whether or not all the bandwidth is being used. With BACP, B channels and dial-up links would be dropped when they aren't needed, thus saving users money.

Filling in gaps

John Coons, a principal analyst at Dataquest, Inc. in San Jose, Calif., said Multilink PPP provides an industry standard approach for the delivery of incremental bandwidth. But it lacks the ability to dynamically control multiple connections in a standardized manner, he added. BACP, used with Multilink PPP, would offer the best of both worlds.

Todd Landry, a member of the product marketing group at U.S. Robotics, said BACP support could be added using a simple software upgrade and wouldn't require any changes to networking hardware.

Landry wouldn't predict when the draft specification would be approved by the IETF, but he speculated that products that support BACP could be on the street by spring.

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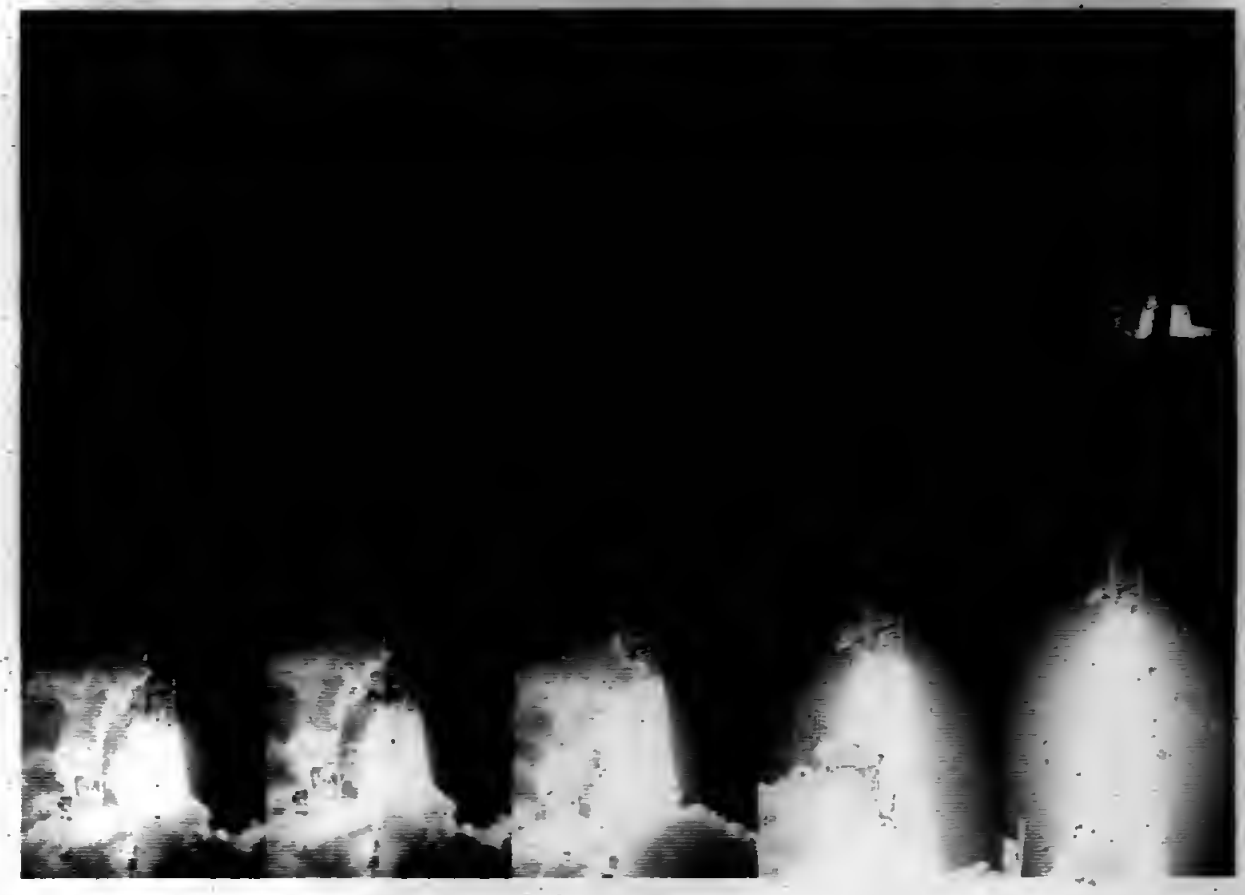

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IBM links Notes to enterprise data

Notes 4.0 to integrate with MQSeries middleware

By Craig Stedman

IBM later this month will announce plans to integrate Notes 4.0 with its MQSeries messaging middleware. This move will give Notes shops a robust but complicated way to open up data on mainframes and other servers to desktop users.

At Lotusphere '96 in Orlando later this month, IBM plans to demonstrate MQSeries with built-in support for the object-oriented LotusScript scripting language embedded in Notes 4.0. The new Notes release is expected to ship this week, and IBM officials said the LotusScript-enabled MQSeries will follow by midyear.

LotusScript should speed up development of applications that tie Notes to MQSeries. Users also will be able to write more complex event-driven programs than the existing Notes macro language allows. Notes clients could be tied directly to a mainframe via MQSeries, potentially reducing response time by cutting out the need to go through a Notes server.

Technical difficulties

The LotusScript support will be added to an initial MQSeries Link for Lotus Notes. The link shipped late last month as part of MQSeries for OS/2 after being available previously as a tool kit. However, early users of the link said working with MQSeries can be a trying experience.

"It was one technical hurdle after another," said Richard Witkowski, director of information systems at Niagara Falls Memorial Medical Center in Niagara Falls, N.Y. The hospital, which uses MQSeries to fetch mainframe-based patient data to use in ordering radiology services, had to turn to IBM's consulting unit to handle some of the development work.

Due in part to the complexities of MQSeries, development of a Notes application for transcribing dictations from doctors and radiologists mushroomed from four months to a year, Witkowski said. Handshake problems between its VSE-based mainframe and OS/2 server also are causing a "ridiculous" 12-second response time on MQSeries data requests, he added.

Despite the snafus, Witkowski said he remains a fan of MQSeries and is intrigued by the promised support for LotusScript.

The same sentiment applies at Barnett Banks, Inc. in Jacksonville, Fla., which plans to use MQSeries to link Notes consumer loan and telebanking applications to its mainframes.

"We're going to exploit both Notes and MQSeries to the fullest," said Ron Berry, technical risk analyst at Barnett's IS unit. But he said working with MQSeries "can be tough for people who aren't used to it." Creating a security curtain around it "was a big challenge" for the bank, Berry said.

"Most companies are not going to jump from doing Notes forms to developing MQSeries applications," said David Marshak, an analyst at Patricia Seybold Group in Boston. MQSeries is being bought mainly by big mainframe shops with lots of programmers, and that probably won't change, he added.

The LotusScript support is part of an Extended Transaction Model scheme that IBM is developing to make desktop-to-mainframe connections via MQSeries less thorny. Bridges that link MQSeries to mainframe-based CICS and IMS transaction processing applications are also scheduled to ship this year. That will eliminate the need to build MQSeries calls into the mainframe code.

Microsoft introduces a new gateway for SNA. See page 61.

Spelling it out

MQSeries: IBM's messaging middleware, which lets pieces of distributed applications on different systems communicate via asynchronous messages. The messages are stored in queues so that other processing can continue while a response is awaited. MQSeries supports more than a dozen server platforms, including mainframes, IBM's AS/400, Unix systems and Microsoft Corp.'s Windows NT.

MQSeries Link for Lotus Notes: Software being built in to MQSeries to give Notes users access to transactional data on mainframes and other back-end servers. The link is part of MQSeries for OS/2 and is available in tool kit form for IBM's AIX operating system. It will be added to MQSeries for AIX, Hewlett-Packard Co.'s HP-UX, Sun Microsystems, Inc.'s Solaris and Windows NT within the next six months, IBM officials said.

LotusScript: A Basic-compatible scripting language with object-oriented extensions such as support for OLE 2.0. LotusScript is embedded in Notes 4.0 as an alternative to the existing Notes macro language. Users will be able to write scripts to create Notes applications that can incorporate objects from other OLE-compliant programs.

On-line censorship fight threatens business access

By Mitch Wagner

Businesses expressed fears last week that international efforts to censor on-line pornography could harm the Internet, curbing not just smut-peddlers and civil libertarians, but mainstream commercial users as well.

"It has little to do with decency. It has to do with information and content," said Bruce Moore, vice president of systems and planning at Bernard Hodes Advertising, Inc. in New York, which posts classified recruitment ads to the Internet on its Career Mosaic site. "Today, Germany doesn't want CompuServe to distribute the alt.sex hierarchy. What if they decide they're not going to offer the jobs-offered newsgroups because they're concerned about losing intellectual content to America?"

Internet controversy

Government crackdown

In past weeks, on-line users have been subject to a wave of government attempts worldwide to censor content on the Internet and on-line services (see related story, page 63). The efforts in the U.S. and the U.K. have focused specifically on pornography. Meanwhile, China has an ongoing effort to attempt to control both pornography and antigovernment speech on-line.

CompuServe, Inc., based in Columbus, Ohio, has been on the hottest part of the frying pan.

In late December, the on-line service abruptly cut off access to 200 newsgroups worldwide and said the German government threatened criminal penalties against CompuServe employees in Germany if the newsgroups remained active.

CompuServe claimed that it had to make the ban global because it had no way of separating German users from the rest of its user base.

The objectionable newsgroups will be restored in the rest of the world once CompuServe finds a way to give its German users a separate news feed, CompuServe spokesman Russ Robinson said.

The newsgroups ban angered many CompuServe users. "I would have cut off access to German subscribers, period!" said Dickford Cohn, a Chicago systems consultant, in one CompuServe forum. "Until and unless their government wakes up to the modern world, they don't deserve access to CompuServe."

Germany wasn't alone in its attempt to control on-line content.

In the U.S., 'net watchers waited for a congressional conference committee to release the Telecommunications Competition and Deregulation Act. It includes strict criminal controls on indecency that would make it illegal to post pornography or even use foul language in public forums on-line.

"The school is still in session as to how nations and governments, whether in this country or in other countries, are going to regulate and participate in commerce on the Internet," said a banking source who requested anonymity. The banker said he is particularly concerned about how nations might choose to enforce their monetary control laws on the 'net.

Many countries regulate how much foreign currency can be brought past their borders, and on-line commerce could be harmed by efforts to extend national borders into cyberspace. "Like environmental law, it will create a whole new area to feed a whole new generation of attorneys," the banking source said.

The IDG News Service contributed to this report.

Find more on CompuServe's blitzkrieg of its German sites. See page 63.

Corrections

Due to a reporting error, "Hyperlinks, wizards and bots, oh my!" [CW, Dec. 26, 1995/Jan. 2, 1996] said Vermeer Technologies, Inc. in Cambridge, Mass., offers World Wide Web development tools that support major relational databases. The version of Vermeer's FrontPage tool that will support those products is due to ship next month.

* * *

Due to an editing error, "Objects of great desire" [CW, Nov. 27] listed the incorrect telephone number for Object World Corp. The correct phone number is (508) 820-4300.

"Browsers compete for spotlight" [CW, Nov. 27] incorrectly stated that Oracle Corp.'s World Wide Web browser is based on software licensed from Spyglass, Inc. Rather, Oracle's Web server was built on Spyglass code; Oracle built its PowerBrowser in-house.

* * *

Due to a reporting error, the story "Cisco preps ATM, remote product blitz" [CW, Nov. 20] said Cisco's new Asynchronous Transfer Mode switch uses a Motorola, Inc. processor. The Cisco box uses a Mips Technologies, Inc. processor.

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Intranets find work in corporate America

Internal use of 'net technologies swells

By Stuart J. Johnston and Tim Ouellette

Users who need basic electronic mail and document sharing, and who want to avoid all the bells and whistles of dedicated E-mail and groupware packages, may soon be whistling a new tune — "intranets."

Intranets refer to the internal corporate deployment of Internet technologies, such as World Wide Web servers and browsers, and Internet mail using Simple Mail Transfer Protocol (SMTP). Those server packages tend to be inexpensive, and SMTP mail capabilities come standard with Unix and Windows NT operating systems.

Corporate interest in intranets has been catching on like wildfire, according to Julian Horwich, executive director of the Corporate Association for Microcomputing Professionals (CAMP), a Chicago-based user association.

"I know of a hospital in South Florida that's just gone that route instead of Notes [for] the sharing of documents and mail," said Bill Karow, a senior software analyst at Workgroup Strategic Services, Inc. in Portsmouth, N.H.

Indeed, using intranets to replace much more costly groupware and E-mail packages may become a trend, said Matt Cain, an analyst at Meta Group, Inc., a Stamford, Conn.-based research firm.

However, Horwich said he isn't aware of any CAMP member companies that have decided to forego groupware and E-mail packages in favor of going exclusively with intranets. Still, at least three CAMP members already have begun to use intranets to supplement their dedicated packages, he said.

Sticking with the classics

Dedicated packages such as Lotus Development Corp.'s Notes, Microsoft Corp.'s as-yet-unshipped Exchange Server and Novell, Inc.'s GroupWise have staunch supporters among user communities who say the products do or will provide features that intranets don't offer — at least not yet.

Greg Scott, information services manager in the college of business at Oregon State University (OSU) in Corvallis, deployed a late beta version of Exchange during the school's Christmas break.

While OSU is a big user of Internet technologies, Exchange can do things that aren't possible otherwise, Scott said.

For example, one Microsoft Visual Basic script queries the business school's registration database every night, checking for students who have dropped or added classes in the previous 24 hours. Those names are then sent via Exchange mail to the specific professors who need to know about changes in their classes.

Likewise, the consensus among many current Notes users is that Notes has a rock-solid place in their internal Web plans [CW, Dec. 18].

Several Notes shops will turn to Web browsers to provide a simple-to-use front end, while maintaining the Notes back end because of its better security, mobile support and development features for mission-critical applications (see story below).

Building apps

"You can go to Netscape, but you can't do as much," said Missy McElwee, manager of Notes development at Sedwick & James, a Memphis law firm. "We will probably end up going through Notes to get to the Internet."

"I am still building robust mission-critical applications with Notes because I can. I can't with the World Wide Web yet," said Kevin Danahy, manager of workgroup application development at Millipore Corp. in Bedford, Mass.

That may change over time, however, as Internet technology vendors add groupware features such as discussion databases, E-mail and actual business applications to their products.

For instance, Netscape Communications Corp. is adding discussion technology from Collabra Software, Inc. and new E-mail capabilities to its Navigator browser (see related story, page 14).

"The real question is with all the interest around the Web, how many companies are making decisions vis-a-vis the Web vs. vis-a-vis E-mail?" said David Marshak, an analyst at Patricia Seybold Group in Boston. "Even in 1996, E-mail is the bigger decision; the Web decisions are still peripheral decisions."

Q: Should you replace dedicated mail and workgroup packages with intranets?

If you need	Consider
Simple document sharing and basic E-mail for users	Setting up internal Web sites and using SMTP mail
More advanced capabilities, such as tight integration with applications or discussion databases	A dedicated E-mail server such as Microsoft's Exchange and/or a dedicated groupware package such as Lotus' Notes or Novell's GroupWise

Tool draws Netscape, Notes in tight embrace

By Tim Ouellette

One third-party Notes developer is pushing the envelope for World Wide Web browser access to Notes databases by letting users get at the data in real time.

Brainstorm Technologies, Inc. in Cambridge, Mass., this week will announce Groupscape 1.0, a tool kit that lets developers create Notes applications that can be used with Netscape Communications Corp.'s Navigator Web browser, so on-line users can directly access corporate Notes and relational databases. For example, developers can create corporate intranets — making internal use of the Internet — with Netscape clients accessing Notes data through a Web page.

Web access

Lotus Development Corp.'s Notes 4.0 is supposed to provide similar features, but the Notes server must first translate Notes documents to Hypertext Markup Language (HTML) and vice versa when communicating with a Netscape client. Groupscape will let users access the data in real time.

"What we are looking to do internally is publish different documents for different users to review," said Wayne Jones, network manager at Network InfoServe in Tampa, Fla. "It is easy to keep the data in Notes, but having everybody run Notes to get at it is difficult. Pushing it out as an HTML document is easier, since users can just run a browser."

Where and when

Notes 4.0 is in the manufacturing stage and will hit the streets Wednesday, according to Cambridge, Mass.-based Lotus. And while expected enhancements to Notes 4.0 due this summer will make HTML and Hypertext Transport Protocol (HTTP) native in Notes servers, analysts said Brainstorm still has a window of opportunity with Groupscape.

"[Groupscape] will have a very useful but short life," said David Marshak, an analyst at Patricia Seybold Group in Boston. "But companies may want to look at Groupscape as a trial to see how useful it is for Notes users to use Web browsers to get at information."

But Groupscape may be widely used even after the Notes upgrade. Brainstorm President Rizwan Virk said the next step for the product is to let developers build groupware and workflow applications independent of Notes.

Due by the end of the first quarter, a standard tool kit supporting only local Notes databases will cost $995 per developer. A Groupscape Pro edition that costs $3,995 per developer will support connections to remote Notes servers; relational databases from Oracle Corp., Sybase, Inc., Informix Corp. and IBM; and applets written in Sun Microsystems, Inc.'s Java language.

Brainstorming about Notes

Brainstorm's Groupscape adds the following features to Notes 4.0's Web integration, but users may have to think of some new uses for the software when Notes 4.0 adds native HTTP and HTML capabilities this summer. Groupscape will:

- Integrate Notes 3.x users immediately with the Internet via Netscape's Navigator browser.
- Connect Netscape users directly to Notes servers in real time. Notes 4.0 must first convert Notes documents to HTML.
- Bring Notes security to Netscape users.
- Let Netscape users run Notes workgroup applications rather than just browse Web documents.

Dual career path

Brainstorm President Rizwan Virk claimed Groupscape can curb training costs normally associated with Notes installations.

End users could work with Netscape rather than the Notes client when accessing Notes data on an intranet.

But users considering Groupscape must look to Notes first before working out an Internet scheme. Groupscape applications will require that a Notes client exist on the desktop — even if the client is not used at all — just so the program can get at the Notes Dynamic Link Libraries to access Notes databases.

"The use of Brainstorm's software for the Internet is more of a secondary usage than the primary database usage of Notes," said Capt. Dick Ryder of the Civil Air Patrol in Dallas. But Groupscape will be available before Notes adds similar features, he added.

— *Tim Ouellette*

AT&T offers mix-and-match networks

By Neal Weinberg

AT&T Corp. has quietly begun offering a service that allows users to blend low-speed frame-relay data transport and high-speed multimedia Asynchronous Transfer Mode (ATM) into one network, *Computerworld* has learned.

With the new interworking service, based on specifications approved by the Frame Relay Forum last August, the network essentially performs the translation between frame relay's variable-length frames and ATM's 53-byte cells.

This allows frame-relay users to slowly migrate to the voice, video and data world of ATM without jeopardizing their current investment. Users can build mixed networks in which different locations are selected for either frame-relay or ATM traffic, depending on customer needs.

Source: Vertical Systems Group, Dedham, Mass.

"It's destined to be really, really important," said Tom Nolle, an analyst at CIMI Corp. in Voorhees, N.J. He added that very few users currently require ATM's high bandwidth, but he predicted that in the next decade frame-relay/ATM hybrids will emerge as the dominant wide-area network configuration.

The Hillsborough County Sheriff's Office in Tampa, Fla., is adding an ATM backbone to its frame-relay network under a federal crime-fighting grant, said J. R. Kennedy, commander of its data operations bureau.

Once the ATM switch is installed, Kennedy will be able to link his frame-relay sites — at three county jails and several remote sheriff's offices — with headquarters. He also will have an ATM link to Pinellas County across Tampa Bay.

Surveillance sharing

While the frame-relay locations will be limited to sending data, Kennedy said he expects to do videoconferencing and send surveillance camera images to his counterparts in Pinellas County.

He said the ability to mix frame relay and ATM is important because he doesn't have the bandwidth requirements to justify ATM at his remote sites, but he said he wants ATM's multimedia capability at the department's headquarters.

Tim Burke, an analyst at The Yankee Group in Boston, said the first wave of interworking customers will likely be frame-relay users with multiple branch offices who are running up against the technology's T1, or 1.5M bit/sec., bandwidth limitations at corporate headquarters.

To fix the problem, the user must replace the frame-relay access device with an ATM device at the central site. Translation between frame relay and 45M bit/sec. ATM traffic would occur automatically via the interworking protocols, Burke said.

Another likely candidate for frame-relay/ATM hybrid networks is a user who wants to add voice or video capabilities at selected locations, Burke added.

ISDN will continue to face hurdles in 1996. See page 53.

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Users, analysts laud Digital comeback

By Michael Goldberg

Users and analysts are optimistic that a reinvigorated Digital Equipment Corp. — which has climbed back from the edge of bankruptcy after two years of corporate and strategic remodeling — can compete with rival vendors in the future.

One caveat, observers agree, is that Digital must expand sales this year — and that isn't a sure thing. But the $13.8 billion company's recent maneuvers, such as the formation of a software unit and the creation of a program to integrate OpenVMS systems with Windows NT applications, have convinced some skeptics.

"They had a miraculous turnaround in 1995," said Tom Willmott, a vice president at Aberdeen Group, Inc. in Boston.

After four years of losses, Digital eked out a modest profit of $122 million in the fiscal year that ended June 30, 1995. In its fiscal quarter that ended Sept. 30, Digital reported earnings of $48 million on $3.3 billion in sales, which included a 10% rise in product revenue. It was the firm's fourth straight quarter in the black.

Meanwhile, Digital announced products and alliances that demonstrated a new focus on listening to market demands.

Willmott said his firm, which was once harshly critical of Digital, believes the company's products are well-positioned to compete against rivals such as IBM, Hewlett-Packard Co. and Sun Microsystems, Inc.

Before the turnaround, he added, "Digital was in disrepute. Customers had turned their attention to other suppliers. [Digital] used [new] products to climb their way back into those accounts." Willmott said products that grabbed the industry's attention include Digital's high-end workstations and a high-end server that has 64-bit addressing to support a large database in memory.

This introduction of the high-end "Turbolaser," or AlphaServer 8400 running on Digital Unix, was an important signal that Digital was focusing on the market first instead of its engineering prowess, said Joseph A. Pollizzi III, vice president of the Digital Equipment Computer Users Society.

"That marked in a very strong way Digital's change in philosophy, that they recognized the Unix environment as the place to be for high-capacity, complex computing," Pollizzi said.

Still, some problems remain. Analysts pointed to several key Digital developments in the past year that were aimed at fixing some major strategic weaknesses:

- A pact with Microsoft Corp. in which the firm pledged that future releases of Microsoft Office and other products would support Digital's Alpha platform. The agreement will keep Digital's Alpha on par with other systems that use RISC or Intel Corp. microprocessors and Microsoft software.
- The formation of a Connectivity Software Business Unit to market products for internetworking and client/server applications. The move clarifies the company's software product goals, which have drifted without a strategy for years.

Digital wins praise for finding ways to be different, said analyst Terry Shannon, editor of "Shannon Knows DEC," a newsletter in Ashland, Mass. Its new software business is a good example, he said.

"Their Internet software makes up a pattern that is platform-independent. Digital has realized, and rightfully so, that the Internet is fraught with opportunity for making money," Shannon said.

In the process, Digital gave users new reason to think about it as a vendor.

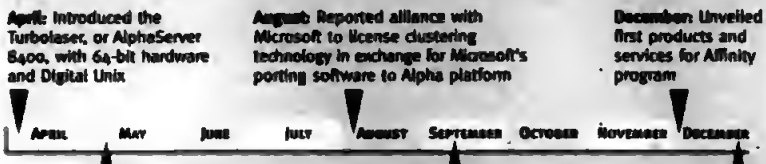
Digital's strategy to link OpenVMS users to Windows NT applications gives new life to users of its proprietary systems, said Robert Fidelman, director of MIS at Shamrock Materials, Inc., a concrete manufacturer in San Rafael, Calif. "The fact that Digital has embraced Windows NT is a big plus for them," he said. Fidelman said Shamrock Materials has used VMS for more than 10 years.

Last year at this time, he said, "I thought Digital looked pretty dead, but [1995] was definitely a sign of its turnaround. We see [that] NT has a lot of the features of VMS that we like. And I see NT as a way to stay on top of the state of the art."

Steve Hankins, vice president of MIS at Tyson Foods, Inc. in Springdale, Ark., said the OpenVMS/Windows NT affinity program "was a signal to us that VMS does have a future." Tyson Foods has used VMS for five years.

Smooth moves

As part of its strategy to strengthen its market position as outlined last year, Digital made these major moves



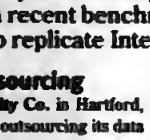
News Shorts

Intel backpedals on benchmarks

Last week, a red-faced Intel issued a press release claiming that a "bug" in the beta compiler used to generate integer benchmark results skewed the results in Intel's favor by as much as 10%. All SPECint 92 benchmarks relating to all Pentium and Pentium Pro chips since September are inflated by at least that amount, Intel officials said. Although Intel claimed it was a voluntary disclosure, one source said the company may have been persuaded to reveal the error after a rival at a recent benchmark meeting disclosed that it was unable to replicate Intel's benchmark results.

Aetna eyes outsourcing

Aetna Life & Casualty Co. in Hartford, Conn., is considering outsourcing its data center operations under what sources said would be the largest such deal ever made. Aetna is weighing an estimated $5 billion, 10-year outsourcing pact that could affect up to 4,000 information systems employees, sources said. They said Aetna is in discussions with several major outsourcing firms, including Integrated Systems Solutions Corp., Electronic Data Systems Corp., Andersen Consulting, AT&T Corp. and MCI Communications Corp./SHL Systemhouse. Formal bids are expected to be made next month.



An Internet stock takes a dive

Shares of **FTP Software, Inc.** in North Andover, Mass., last week lost more than half their value in the space of a few hours after the company announced that fourth-quarter revenue would be below that of the year before. FTP's traditional PC Internet software market last year was invaded by much larger competitors. The stock fell from 25 1/4 to 11 7/8.

Frame fractures Adobe stock

Stock in **Adobe Systems, Inc.** fell 29% last Thursday following disappointing financial results for the firm's fiscal fourth quarter. Analysts traced Adobe's woes to its acquisition in June of Frame Technology Corp. Adobe stock closed at $58.50 on Thursday but dropped $17 a share in the afterhours market. Adobe reported that revenue rose only 7%, from $187.6 million to $200 million. The firm had a net loss of $11.8 million, including $46.5 million related to the Frame acquisition.

Notes 4.0, CC:Mail 6.0 slip

Lotus Development Corp. will ship Notes 4.0 on Wednesday. Though it was originally slated for a Dec. 28 release, users didn't seem surprised at the delay. They said they expect to catch their first glimpse of the upgrade at Lotusphere '96, which will be held later this month in Orlando, Fla. Lotus, in Cambridge, Mass., also acknowledged that CC:Mail 6.0, an upgrade that had been slated to ship by December, hasn't gone into manufacturing yet. No new target date has been set, but a Lotus spokesman said the product is in beta testing.

Next NT heads for beta

Microsoft Corp. is sending an early beta of the next release of Windows NT to select users, sources close to the company said. The release, referred to as the "shell update release," adds the Windows 95 user interface to Windows NT. It is scheduled to officially enter beta testing in a week or two and is due for final release by the middle of the year.

The Web wins out

After paying $50 million for the Interchange on-line business service in 1994, **AT&T** has decided to scrap the proprietary service, which was to have been a competitor to CompuServe and America Online. Instead, Interchange will become a World Wide Web site, AT&T officials said last week.

Cheyenne ships Arcserve 6

Cheyenne Software, Inc. is shipping Version 6.0 of its Arcserve storage and backup software for Novell, Inc.'s NetWare. Cheyenne also revamped its pricing. For networks with fewer than 25 users, the software costs $795; for larger Novell networks, it costs $1,895.

Xylogics' Annex gets update

Bay Networks, Inc. later this quarter expects to integrate its Optivity Enterprise network management system with **Xylogics, Inc.**'s Annex Manager net management offering. This will let Xylogics users control Bay's internetworking equipment.

Boeing Takes Off With The Flying Dutchmen

The Boeing Commercial Airplane Group took off with the 777 this year; they also took off with the Baan Company. About to make a major process redesign commitment, they invited in "The Flying Dutchmen" from Baan Company. The result: Boeing placed an initial order valued at $20 million for Baan's TRITON family of client-server finance, manufacturing, distribution, transportation, service and project management applications.

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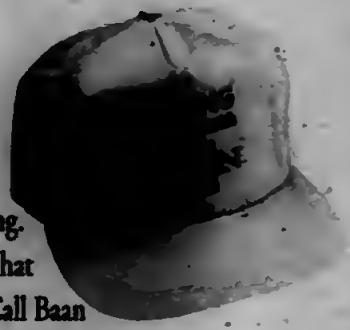

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The Flying Dutchmen

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TBA

Cisco acquisitions yield overlapping Ethernet gear

By Bob Wallace

Cisco Systems, Inc. last week rolled out products born of three key acquisitions made last year. They include switches that, as users had feared, will overlap with the vendor's existing Ethernet switching systems line.

Menlo Park, Calif.-based Cisco launched its Catalyst Ethernet switches last March and then acquired Ethernet switch vendor Kalpana, Inc. in October. That acquisition was followed in September with the purchase of Grand Junction Networks, Inc., which makes Ethernet and Fast Ethernet switches.

At the time of the Grand Junction buy, users said Cisco's strategy was unclear. They worried about the vendor's ability to reconcile its different Ethernet switch lines.

"They have so many different Ethernet switch models that it's tough to tell which ones are the best for different [purposes]," said David Meyer, a senior network engineer at the University of Oregon in Eugene. "We already use their Catalyst switch and the ones they got from Kalpana."

A Cisco spokeswoman acknowledged there is some overlap in the company's Ethernet switching line. "But we'd rather have overlap in a couple of key areas than have glaring holes in our product line," she said.

Switching systems

The CiscoPro switches overlap with the Kalpana stackables, which in turn overlap with Cisco's Catalyst Ethernet switches.

Analysts said product-line overlap creates confusion for prospective and existing Cisco Ethernet switch users. It also means users will have to spend a good deal of time deciding which switch or switches best meet their needs.

"I expected Cisco to reconcile the different product families and come out with one consistent line of Ethernet switches to make life easier for users," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J. "Although that may not be realistic for a company that's made so many acquisitions, it's what users expect."

Growing family

The products Cisco gained from Grand Junction run under the CiscoPro family name, as do remote access devices the vendor gained from Combinet, Inc. and an Internet gateway package created by Internet Junction, Inc.

The CiscoPro switches were designed to help users migrate from shared-capacity LANs to switched internetworks that offer dedicated bandwidth.

The new products made available through the Grand Junction acquisition include the following:

- The CiscoPro EtherSwitch 10/100, with 25 switched Ethernet ports and two 100Base-T uplinks.
- The CiscoPro EtherSwitch 1200, with 25 switched Ethernet ports and 1,024 media access control addresses.
- The CiscoPro EtherSwitch 1402 and 1408, with 100Base-T and Fiber Distributed Data Interface (FDDI) uplinks.
- The CiscoPro EtherSwitch 1442 and 1448 FDDI, with preconfigured switches that have an FDDI connection and an expansion slot for a 100Base-T link or an additional FDDI connection.

Cisco will offer one-port and eight-port 100Base-T twisted-pair uplink modules, one- and four-port models for fiber cable and three types of FDDI uplink modules.

CiscoPro CPA201 and 202 are PC adapter cards that use Integrated Services Digital Network (ISDN). CiscoPro751 and 752 remote access products also use ISDN. The CiscoPro1140 is a PC adapter card that links Novell, Inc. LANs to WANs.

CiscoPro Internet Junction is a software gateway from Novell IPX to TCP/IP networks that provides secure Internet access for Novell networks without requiring that TCP/IP software be installed on every desktop.

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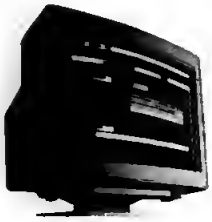

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MacIS closes, but Internet fills gap

By Lisa Picarille

MacIS, the largest and most influential of a handful of user groups for Macintosh IS professionals, apparently has disbanded.

MacIS officials couldn't be reached last week. But Apple Computer, Inc. claims that the Mason, Ohio-based group, which has more than 360 members in the U.S., is undergoing a metamorphosis.

"[The group is] closing their doors because they found that what they were doing was taking place in other venues — like on the Internet and at trade shows," said Eric Wee, an Apple spokesman. But some users suggest that MacIS members may have become frustrated trying to get Apple to address the concerns of corporate information systems.

"Apple essentially has never emphasized the IS infrastructure," said Mike Bailey, a systems analyst at Lockheed Martin Missiles and Space, an aerospace firm in Sunnyvale, Calif., which has more than 6,500 Macintoshes. Lockheed gets direct support from Apple because it is a large customer, Bailey said.

Corporate concerns

Apple historically has been torn between continuing to serve its core user base — education, multimedia, desktop publishing and home users — and trying to break into the lucrative corporate market.

After years of lip service, Apple has only about a 7% share of the corporate market, according to Dataquest, Inc., a market research firm in San Jose, Calif.

Bailey, a founder and former president of another user group — the Apple Professional Exchange, which now exists only online — said he decided against joining MacIS when it was formed in 1990 because "it's like beating your head against the wall to get Apple to listen to IS concerns."

The charter for the Apple Professional Exchange is for members to share information, not unite to pressure Apple into acknowledging specific needs.

Yet a former member of MacIS, who requested anonymity, called the group, "a very boisterous and vocal group that got under Apple's skin."

The group held semiannual national conferences to present Apple with a list of top IS concerns.

"Apple wants to communicate with IS professionals but only on [its] own terms. Apple doesn't want IS professionals as a group giving [it] a list of requirements," Bailey claimed.

Apple wouldn't directly address those issues, but a spokesman said corporate concerns are important and will be addressed through several avenues.

"Apple is rationalizing that using the Internet and [electronic mail] has made it possible to stay in closer contact with customers. They think it is not necessary to have a collective voice on the part of IS, and that they can deal with the individual IS manager over E-mail," said Pieter Hartsook, editor of "The Hartsook Letter," an industry newsletter in Alameda, Calif. "It's a bad sign for Apple's position in the corporate market."

Apple said it will use other methods to communicate with IS professionals.

For example, the Cupertino, Calif., computer maker plans in the next month to launch a World Wide Web server devoted to its business customers.

"There will be product information, enterprise technology directions and other information," Wee said. Apple also plans to hold more local and regional forums and meetings for IS users, he said.

But economic concerns and the increased use of the Internet to communicate, may have played a role in the demise of MacIS.

"IS managers don't always have the resources to attend yet another meeting somewhere outside the office," Hartsook said.

No big surprises at Macworld

No blockbusters, but plenty of third-party announcements

By Lisa Picarille

Attendees of this week's Macworld Expo in San Francisco won't hear any blockbuster announcements, but they will get a hodgepodge of third-party products for the Internet, some Newton 2.0-related goodies and a new line of entry-level Power Macintoshes.

Apple Computer, Inc. will announce the following:

- Apple Media Tool 2.0, an object-oriented, cross-platform, multimedia authoring tool that lets users create interactive titles without programming or scripting. This version lets users build multimedia projects that run native on the Power Macintosh. It supports QuickTime VR, custom color palettes, Apple Script and hypertext links.
- a 3D Metafile (3DMF), the Cupertino, Calif., computer maker's proposed standard for three-dimensional graphics exchange across the Internet. The 3DMF format works across many different platforms, including the Mac OS, Windows and Unix.
- Shiner, a PowerPC Unix server. This long-awaited box is likely to make its debut at the show, sources close to Apple said.

Third-party vendors also are expected to serve up a smorgasbord of Macintosh products, including the following:

- a Natural Intelligence, Inc. in Cambridge, Mass., is expected to ship Roaster, the first development tool that lets Macintosh users create applets in Sun Microsystems, Inc.'s Java programming language.
- Internet service provider Netcom On-Line Communication Services, Inc. will demonstrate a Macintosh version of NetCruiser. The Macintosh release of the company's proprietary Internet software package is due in the first quarter.
- AllPen Software, inc., a Los Gatos, Calif., start-up, will unveil NetHopper, the first World Wide Web browser for Apple's Newton personal digital assistant (PDA). NetHopper lets users connect directly to the Web via Internet service providers that provide Point-to-Point Protocol/Serial Line Internet Protocol connections. Using NetHopper's browser, users can view any Web page.
- Digital Ocean, Inc., a PDA maker in Lenexa, Kan., is expected to unveil Seahorse, which runs Version 2.0 of the Newton operating system. Seahorse has a backlit screen, PCMCIA slot, modem and infrared communication capabilities. It will cost less than $1,500.
- Power Computing Corp. will unveil its entry-level PowerCurve family of Power Macintosh clones. The Milpitas, Calif., clone maker's line of 601-PowerPC-based machines will offer Nubus and Peripheral Component Interconnect (PCI) configurations.
- Number Nine Visual Technology Corp. in Cambridge, Mass., is shipping its IMage128 for the Power Macintosh, the first 128-bit graphics and video accelerator for PCI-based Power Macintoshes. The card is aimed at users in the prepress, desktop publishing, multimedia authoring and imaging fields. Models with 4M and 8M bytes of video RAM will be offered.

Firms investing in 'net management

By Bob Francis

Looking to untangle the web of Internet traffic for large corporations, systems management vendors McAfee Associates, Inc. and Tivoli Systems, Inc. are investing in Internet software provider Net.Genesis, Inc.

The two companies plan to integrate software developed with Net.Genesis into their systems management products, officials from Santa Clara, Calif.-based McAfee and Austin, Texas-based Tivoli said.

These tools will provide corporate information systems managers with a level of functionality similar to current systems management for LANs and WANs.

Cambridge, Mass.-based Net.Genesis shortly will unveil a World Wide Web traffic monitoring package that eventually will be incorporated into Tivoli's TME systems management software and McAfee's systems management products.

That will be the first step by both companies to give corporate Internet users the same level of systems management found on client/server networks.

"Web technology looks like black magic to many IS managers today," said Gene Hodges, director of product marketing at McAfee. "These Internet tools will be integrated into current systems management tools."

Typical systems management functions — such as guaranteeing information integrity, access security and billing — eventually will evolve to include the Internet. Internet providers already use some of these tools, such as billing, and will simply migrate them to systems administration packages, Hodges said.

Mike Grayson, president of Fig Tree Computer Services, a consulting group in Plano, Texas, said his corporate clients are just beginning to realize the need for systems management tools for Internet traffic.

"We had one client where we found an amazing amount of traffic with the domain name Playboy.com going over the company's Internet, and we were sure it wasn't work-related traffic," he said.

External abuse also

Companies are finding not only internal abuses, but also external ones, such as outsiders gaining access to internal files or clogging corporate networks with useless traffic, Grayson said. "Those are the two main problem areas we've seen companies expose themselves to with the Internet," he said.

IS managers will require more systems management tools as Internet use becomes a part of the corporate network, said Tivoli President Frank Moss.

McAfee, which entered the systems management market in 1994 with its purchase of Brightworks, focuses more on LANs, while Tivoli's products were designed for enterprisewide systems management.

McAfee and Tivoli aren't alone in searching for answers to the sticky question of Web management. Computer Associates International, Inc. plans to integrate several products from Internet wunderkind Netscape Communications Corp. with its CA-Unicenter enterprisewide systems management products.

Hewlett-Packard Co. also has added some products from Netscape to its OpenView platform.

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Travel agencies take arctic 'net excursion

By Mitch Wagner

It seems that today a company needs to go to the ends of the Earth to do something fresh on the Internet.

So that is exactly what travel agencies Mountain Travel-Sobek in El Cerrito, Calif., and World-travel Partners in Atlanta did.

They sponsored an expedition of about 40 people who spent most of December in Antarctica cruising around cold waters in a specialized ship, photographing wildlife and scenery and going ashore in inflatable boats. The travelers relayed their picture and diary entries via communications satellites to an Internet service provider in Dallas, where they were immediately posted on the World Wide Web.

The technology to link to the Web is simple, said Christian Kallen, project director at Mountain Travel-Sobek. Traveling on shipboard were an Apple Computer, Inc. Power Macintosh 7500 with 1.6G bytes of disk storage connected to CD-ROM-burning equipment and digital cameras.

Most of the travelers wrote their diary entries on PowerBooks supplied by the travel agencies, although some brought their own notebook computers. Pictures and text were uploaded though a mobile downlink connected to orbiting Immarsat communications satellites, then relayed to a Web server maintained by the Synapse Group in Dallas and posted to the Internet.

The travelers also hosted twice-daily live chat sessions on the Web. The sessions were relayed through the Immarsat satellites.

The only real problem with the setup was obtaining a good line-of-sight transmission to the satellites, which was a hit-and-miss affair, said Kevin Twidle, a director at 7E Communications Ltd. in Ascot, England, which managed communications for the trip. Still, the travelers managed to update the site regularly, although they missed several chat sessions, Twidle said in a shipboard telephone interview from Antarctica.

Picture and diary entries *from the arctic excursion were transmitted via communications satellites to an Internet service provider*

Attention-getter

The Antarctic excursion, combined with the Web site, was an effort to drum up new business in the troubled travel agency sector. Paradoxically, while travel is growing in popularity worldwide, travel agencies are getting squeezed. Leisure travelers are becoming more willing to book travel accommodations for themselves when the trips are simple. Meanwhile, airlines are cutting commissions on ticket sales — traditionally a big source of revenue for travel agents.

"Travel agencies are going to have a significant role, but they're going to have to specialize and become more expert in specific areas and destinations," said Michael Robbins, principal of The Tourism Co., a travel agency consultancy in North York, Ontario.

Insecurity blanket

Netscape has had some security issues in the past few months

- **August 1995:** A French student cracks part of Secure Sockets Layer data encryption protocol used in the export version of a Netscape Web server
- **Early September 1995:** Two University of California students in Berkeley reverse-engineer the instructions Netscape uses to create encryption keys during secure sessions
- **Late September 1995:** Netscape calls on the Cypherpunks, a benign hacker group, and other security experts to stress test and report security flaws in its products
- **January 1996:** An MIT student repeats the August 1995 incident, only faster and less expensively

(AUGUST, SEPTEMBER, OCTOBER, NOVEMBER, DECEMBER, JANUARY)

Netscape breached again

By Kim S. Nash

Netscape Communications Corp. suffered another security break-in last week when an MIT computer science student cracked part of the encryption safeguard used in the software maker's non-U.S. World Wide Web products.

Although a similar break-in was performed by a student in France last summer (see chart), MIT student Andrew Twyman did it faster and less expensively.

The deed wasn't malicious, but rather an attempt to demonstrate "how quick and easy it is" to violate the security techniques used in software products shipped outside the U.S., said Jonas Lee, general manager at Integrated Computing Engines, Inc. (ICE).

Waltham, Mass.-based ICE supplied the $83,000 Unix workstation Twyman used in the experiment, along with free computer time. Twyman, who is also a part-time intern at ICE, declined to comment last week because he was studying for exams.

The federal government mandates that nothing stronger than an encryption key of 40 bits be used in products sold outside the U.S. Inside the U.S., however, products can use 128-bit keys, which are far tougher to decipher.

The policy is a "real thorn in our side," a Netscape spokeswoman said. The Mountain View, Calif., firm and dozens of other computer vendors continue to lobby for looser export controls.

The Clinton administration promised last August to develop guidelines by the end of 1995 for the export of products with a stronger 64-bit key, but no actual policy revisions have yet materialized [CW, Aug. 21].

The latest break-in isn't cause for alarm, said Graham Silver, a senior consultant at Bell Sygma, Inc., a large telecommunications firm in Toronto.

"Netscape products are as secure as they can be. We haven't heard of any break-ins here," Silver said, referring to the 50 to 60 Netscape Web servers that Bell Sygma runs.

Tool sets that go beyond the Web. See page 63.

Workflow tools head for Web

By Suruchi Mohan

As companies put more applications on the World Wide Web, workflow software vendors want to make sure they don't get left out in the cold. The latest effort to blend Web and workflow comes from Ultimus, a start-up in Raleigh, N.C.

Ultimus last week announced major enhancements to its workflow product of the same name, including a feature called WebFlow.

WebFlow allows end users to design workflow applications for Microsoft Corp.'s Office environment. For example, a user can get onto a company's Web site and fill out a form that triggers a workflow process in the company.

"Workflow on the Web is a way to integrate islands of automation," said Nathaniel Palmer, a senior market analyst at Delphi Consulting Group in Boston. For example, if users in an organization are on different hardware platforms, they sometimes don't have access to workflow applications.

Building an internal corporate Web site, or intranet, is a way to connect all these systems through the Web. "The intranet applications will drive early implementation of Web-enabled workflow," Palmer said.

Other factors

Although pleased with the Ultimus product, Van Yedla, president of Workflow Reengineering, an integrator in Rochester Hills, Mich., said Internet-based workflow wasn't why he chose Ultimus. He said he liked the low cost, ease of use and the integration with the Notes groupware environment.

Version 2.0 costs $2,950 for a starter kit. It includes the following major features:

- It can interface with any commercial document management software.
- Its Notes client lets Notes users take part in a workflow process.
- Its electronic-mail agent lets users launch workflow processes via simple E-mail.

Agent API lets users develop their own automation agents

File agent for file management

Queues for additional tasks

Sequential groups allow workflow tasks to be routed to users in a definite order

Despite these features, Ronni Marshak, editor in chief of the "Workgroup Computing Report" at Patricia Seybold Group in Boston, said she isn't sure the start-up company will succeed.

She praised the Ultimus technology for removing some of the barriers to setting up workflow applications but said the company needs "an alliance with a vendor who offers an E-mail platform. The fickle public doesn't want to try anything that has not been blessed by IBM or Microsoft."

More vendors heed the call, enter paging market

Companies target mobile users with voice messaging products, applications

By Mindy Blodgett

SkyTel Corp. may have been the first out of the block with two-way messaging over a narrowband personal communications services (N-PCS) network, but it won't be alone for long.

A growing number of companies are jumping into the nascent market. Several are expected to begin offering two-way paging and voice messaging services in the coming months.

The added competition will mean more applications and lower prices for mobile users who swear by their pagers, industry observers said.

Remote communications

"This year, two-way messaging could really take off," said Anne Lynch, an analyst at the Giga Information Group in Boston. "There is a lot of investor excitement."

Because the N-PCS networks offer more radio spectrum than one-way paging, users soon should see full data-transfer services via two-way messaging.

Currently, two-way messaging is confined to acknowledgment paging and doesn't allow original messages in replies. For instance, with the SkyTel device, users can choose from several canned responses such as "on my way" or "OK."

Reaching out

According to The Yankee Group in Boston, paging is the largest sector of the wireless messaging market, with approximately 27 million paging users and a penetration rate of 10% of the U.S. population.

"One-way [messaging] is so easy and pervasive," said Roberta Wiggins, an analyst at The Yankee Group in Boston. "And two-way is currently not real two-way messaging; it is acknowledgment paging, so two-way has a ways to go." Wiggins said a burgeoning trend is the shift away from numeric pagers to devices with more advanced alphanumeric messaging capabilities.

Two-way systems

One company that plans to offer voice and data is Paging Network, Inc. (PageNet) in Plano, Texas. PageNet plans a commercial rollout of its N-PCS offering, VoiceNow, in Dallas, San Francisco and New York by the middle of the year. VoiceNow is billed as a portable, wireless answering machine.

PageNet also plans to conduct two-way messaging test trials in Atlanta in the first half of the year. The two-way messaging service will use the same network infrastructure as VoiceNow, according to PageNet officials.

Washington-based SkyTel, which began offering two-way messaging over N-PCS via Motorola, Inc.'s Tango device, plans to offer applications such as database querying.

PageMart, Inc. in Dallas plans to conduct field trials of a two-way messaging system based on Motorola's Flex family of protocols in the Dallas/Fort Worth area.

A nationwide commercial rollout is planned for the fourth quarter.

Other companies planning two-way messaging services include AirTouch Communications, Inc. in Dallas and AT&T Wireless Services. AT&T has developed a protocol called Personal Air Communications Technology, which some in the industry say may rival Motorola's Flex.

PCS Development Corp. in Greenville, N.C., also plans trials in the next few months of a two-way voice messaging service in Atlanta and Boston.

RadioMail is taking a new tack. See page 55.

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IBM preps communications cornucopia

By Bob Wallace and Laura DiDio

IBM is preparing a wide-sweeping product launch that will include everything from key modules for its highest-end hub to stand-alone Fast Ethernet and ATM switching systems.

The new switches will give users a bandwidth boost. They will allow customers to migrate from today's often-congested, shared-capacity 10M bit/sec. Ethernet and 16M bit/sec. Token Ring LANs to switched internets, which provide 10M, 16M, 25M or 100M bit/sec. of dedicated bandwidth per port.

The products will be announced at the ComNet conference in Washington later this month, according to industry sources. IBM declined to comment.

At that conference, Armonk, N.Y.-based IBM will introduce a 12-port, 25M bit/sec. Asynchronous Transfer Mode (ATM) concentration module for its 8260 Nways Multiprotocol Switching Hub. This concentration module will allow the switch to aggregate multiple 25M bit/sec. data inputs into one or two faster pipes that go from the 8260 to ATM backbone networks.

ComNet

Interest piqued

Analysts and users agreed that ATM at 25M bit/sec. is alluring.

"ATM at 155M bit/sec. is pretty much for the hobbyists, not for your average user company," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "But ATM at 25M bit/sec. is cheaper [than ATM at 155M bit/sec.], and users can find ways to fill that pipe at the desktop."

John Chapman, lead information architect at Amoco Corp.'s architecture and standards unit in Chicago, agreed. "We've got paper pushers for which sharing 10M bits of capacity is fine. But we've also got envelope pushers using high-bandwidth applications like seismology analysis who can fill any pipe we give them."

IBM will further enhance the 8260 with a 155M bit/sec. ATM uplink for unshielded twisted-pair wire and one that uses shielded twisted-pair wire, sources said.

IBM will also announce an ATM switch code-named Gatwick. It will support multiple 25M bit/sec. ATM ports and a 155M bit/sec. ATM uplink to servers or backbone networks.

Gatwick, also known as the 8285 Workgroup Switch, is a strategic product because it addresses the high cost of ATM switching technology by offering less expensive and slower ATM connections to the desktop.

ATM at 25M bit/sec.

Vendors now offering ATM switching systems at this speed include the following:

- IBM
- Madge Networks, Inc.
- First Virtual Corp.
- WhiteTree Technologies, Inc.
- Advanced Telecommunications Modules, Inc.
- Chipcom Corp. (now 3Com Corp.)
- Optical Data Systems, Inc.

IBM will offer remote monitoring support for the 8260 for users looking beyond Simple Network Management Protocol information to detailed switch performance data.

IBM will also embellish its mid-range 8250 Intelligent Hub, which it developed with Chipcom Corp., by adding a 24-port Ethernet module to the system and additional Token Ring management capabilities.

Some speculated that IBM will dive in to the 100M bit/sec. Fast Ethernet market with a stand-alone switch that would offer multiple 100M bit/sec. ports. The Fast Ethernet market is growing because Bay Networks, Inc., Standard Microsystems Corp., 3Com Corp., NetWorth, Inc. and others have announced this type of switch.

Intel to cut Pentium prices, again

Hopes Pentium Pro cut will lure users

By Jaikumar Vijayan

Users thinking of buying PCs in the near future may want to wait until Feb. 1 at least.

A sample of systems based on the 150- and 166-MHz Pentium chip

Vendor/Product	Features	Price	Availability
IBM/PC 300	166 MHz, 16M to 128M bytes of RAM, 1.2G-byte hard disk	$3,657	February
Hewlett-Packard/Vectra VL	150 and 166 MHz, 8M or 16M bytes of RAM, 1.2G- and 1.6G-byte hard disk	$2,110 to $3,445	February
Dell/Dimension XPS	166 MHz, 16M bytes of RAM, 2G-byte hard disk, four-speed CD-ROM	$3,479	Now

That is when Intel Corp. is expected to once again substantially roll back prices on several of its mainstream Pentium processors by at least 25% to 30%, according to informed sources.

Intel is also expected to cut prices on its recently introduced Pentium Pro chips — but only by about 5%, the sources said.

Observers said the deepest cuts are expected to be on the 133-MHz and 120-MHz Pentiums, which will make way at the top of the food chain for Intel's 150-MHz and 166-MHz Pentium chips. Intel announced those faster processors last week.

This means users can expect to see fully configured 133-MHz systems with at least 8M bytes of RAM and a 1G-byte hard disk in the $2,000 to $2,500 price range. And 100-MHz and 120-MHz Pentium systems with the same configurations will fall into the entry-level range of $1,600 to just under $2,000.

Rethinking choices

These pricing moves are causing some companies such as Fish & Richardson, a law firm in Boston, to reevaluate their earlier decision to standardize on 90-MHz Pentium systems.

"We could still be buying 90-MHz systems because that is all we really need for the next two or three years. But because of the huge erosion in prices, we will probably look at the 133-MHz soon," said Ian Stewart, director of information systems at Fish & Richardson.

Intel confirmed the price cuts but refused to comment on specifics.

Meanwhile, a lineup of at least 50 vendors simultaneously released products based on Intel's 150- and 166-MHz Pentium chips last week.

The lineup included Hewlett-Packard Co., IBM, Dell Computer Corp., Unisys Corp. Digital Equipment Corp. and Gateway 2000, Inc. (see chart).

The price cuts on Pentium Pro chips — however small — signal Intel's intent to accelerate the chips' migration into the mainstream commercial business applications market.

The chip, which is optimized for 32-bit application environments, has proved somewhat of a dud in standard Windows 3.1 and Windows 95 Office applications [CW, Sept. 25].

But some analysts said they expect Intel to use a combination of price inducements and hardware tweaks to herd more commercial users to the Pentium Pro by year's end.

"It is going to get a little difficult for vendors to market the differences between a Pentium Pro system and a Pentium system" by the end of the year, predicted Tony Massimini, an analyst at Semico Research Corp. in Scottsdale, Ariz.

Pentium Pro will appear in SMP servers this quarter. See page 41.

New interfaces to lead users to SAP R/3 route

By Julia King

More and more information systems are leading to SAP AG's R/3 enterprise client/server software. One reason is the ever-growing array of handy R/3 interfaces hitting the market.

SAP announced last week a software bridge to link companies' R/3 applications to Automatic Data Processing, Inc.'s (ADP) payroll outsourcing services.

Separately, $6 million Object Power, Inc., a spin-off of Cambridge Technology Group in Cambridge, Mass., unveiled object-oriented tools and components to build links between R/3 applications and legacy systems.

"No one can throw out their entire legacy base, so invariably you need to access [and feed] some legacy systems," said Jane Johnston, vice president of Siemens-Nixdorf's Business Solutions Group in Burlington, Mass. Object Power's object technology lets users access SAP data and functionality and add to it and augment it very rapidly, she said.

For example, a manager developing a sales forecast for snow tires could consult historical sales data in an R/3 system and import data from the National Weather Service database or another source to enhance the analysis.

Suburban Propane Co. in Whippany, N.J., is the first user of the R/3 ADP interface. It processes the firm's 3,500-person payroll.

"Basically, we just feed the gross payroll files to ADP. There is nothing we have to fine-tune," said Jack Welch, human resources IS manager at Suburban. After processing is complete, ADP feeds payroll information directly into Suburban's R/3 general ledger application, he said.

Last October, SAP came out with its own U.S. payroll application, which is part of the 3.0 release of R/3. Even so, it makes sense to furnish users with interfaces to other systems (see chart), said Lou Rondagh, SAP's senior product manager for human resources.

SAP's integration plans include providing standard interfaces between its R/3 client/server human resources software and the following:

- Other outside payroll processing firms
- Integrated voice response systems, which would enable employees to update their own personnel information over the telephone
- Terminal-based kiosks, where employees could sign up for health care benefits, check job postings and register for training classes

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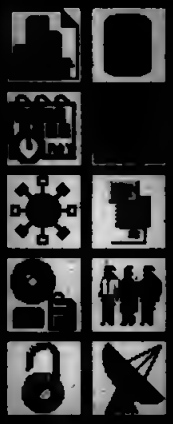

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Schwab woos on-line home traders

By Mitch Wagner

Budding captains of industry will be able to more easily pilot their own financial courses using software that Charles Schwab & Co. plans to release nationwide today.

The E.Schwab program from the San Francisco brokerage is an electronic stock and bond trading program that lets retail investors directly conduct their own transactions.

Customers use E.Schwab software to dial in to Schwab computers over standard telephone lines and perform trades.

The program is part of Schwab's effort to gain a toehold in home finance, which is expected to become a lucrative market, said Mark Hardie, an analyst at The Tower Group, a banking and finance consultancy in Wellesley, Mass.

The potential market for home finance and banking is as large as the number of homes that have PCs and modems, Hardie said.

Currently, 33% of U.S. households, or 30 million, have PCs. That number is expected to increase to 60% by the year 2000. Half of today's home PCs are modem-equipped, and modems are now considered standard equipment on home PCs.

Many investment houses, such as Fidelity Investments, Inc. in Boston, already offer electronic trading programs. But customers and analysts say the Schwab program is the first to offer significant breaks in fees in exchange for customers' relying exclusively on electronic trading. There is no contact with salespeople or brokers.

Fees for E.Schwab trades are $39 for the first 1,000 shares, and 3 cents per share for each additional share traded.

That compares with an average of $80 per trade for other Schwab services, said Randy Goldman, director of marketing at Schwab.

Before the national release, Schwab tested the software in Florida, Texas and California. Jim Hightower, a 48-year-old personal injury lawyer, in Pensacola, Fla., started using it in November.

"I like the ability to enter orders virtually immediately, without having to first call a broker and talk to him," Hightower said. He said he is satisfied with E.Schwab but would prefer that the software notify its users of the success of trades more quickly than the current 15- to 20-minute delay.

Play the market

Schwab software offers discounted, fully automated trading priced at $39 for the first 1,000 shares traded and 3 cents per share for additional shares. Customers must open an account with $5,000 cash and securities. Free technical support is provided for the first month; after that, customers are allowed one free call per month. Each additional call costs $5.

Making money

Fred Nerone, chairman of the business administration department at International College in Naples, Fla., said he uses E.Schwab for up to five trades daily. Its quickness and low fees allow him to turn a profit even on small market changes — as little as one-eighth of a point.

The software runs on Microsoft Corp.'s Windows 3.1; a Windows 95 version is due Feb. 15.

One of Schwab's most aggressive competitors in electronic stock trading is TradePlus, Inc. in Palo Alto, Calif., which offers dial-up electronic trading using its ETrade software. The fees are far lower than Schwab's — a flat $19.95 per trade.

But analysts said despite the lower prices at ETrade, many investors may choose Schwab because of its better-known name.

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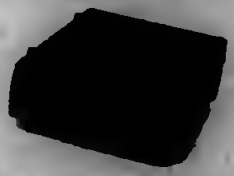

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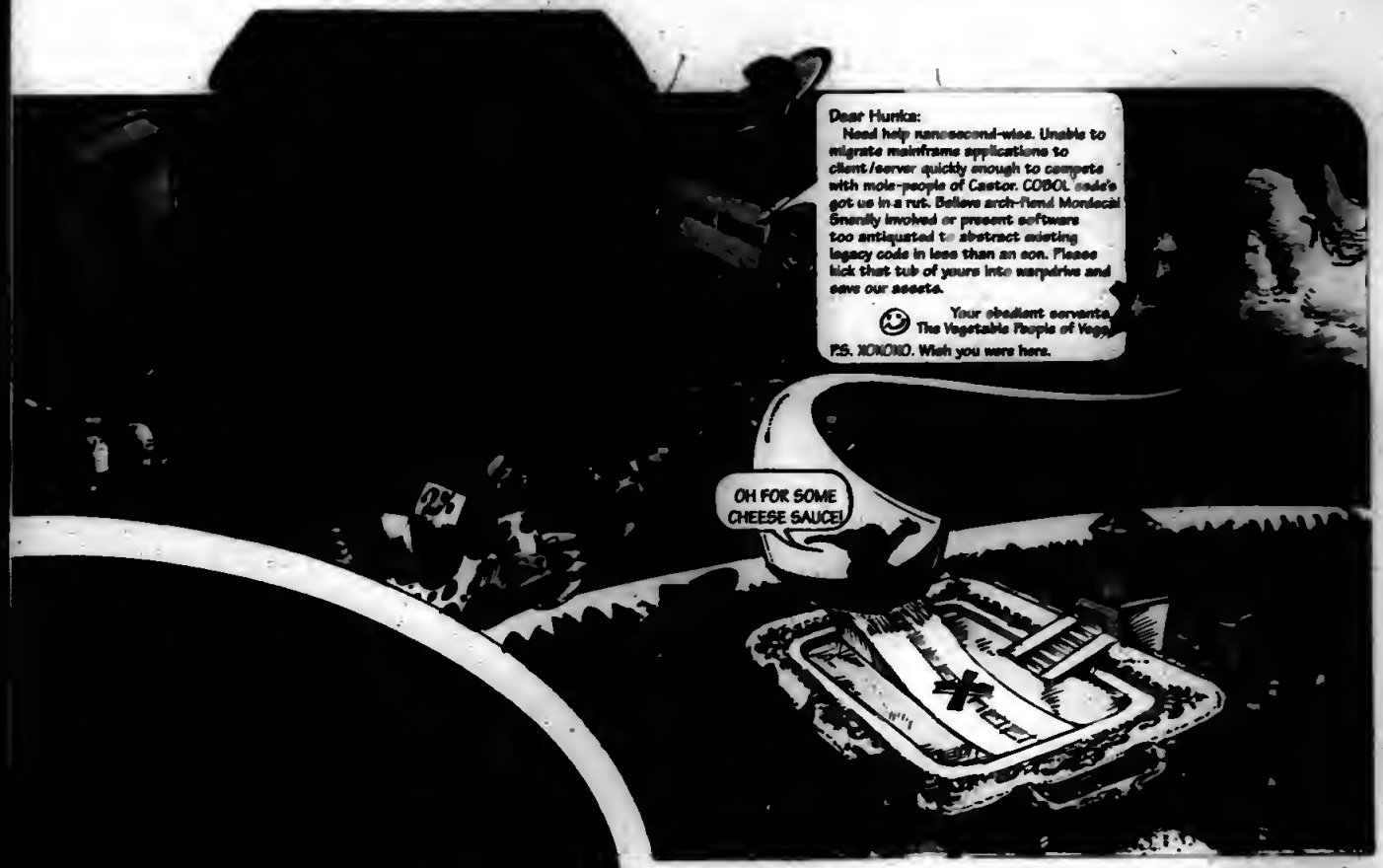

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WHAT THE BIG GUYS USE

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Net address tracking is made easier

By Patrick Dryden

Administrators of Novell NetWare networks can start the new year with one less headache: tracking unique TCP/IP addresses for all [illegible]

On Technology Corp. in Cambridge, Mass., recently [illegible]ed software for centrally managing these addresses. It has been a time-consuming task that is becoming increasingly vital outside the Unix world as NetWare users demand access to IP networks and the Internet.

On Technology's IPTrack can manage station types beyond PCs on NetWare-based subnetworks, with greater flexibility when reusing addresses dynamically. The lack of such support from Novell, Inc. led beta testers to adopt this NetWare Loadable Module (NLM) early.

These NetWare administrators cited two reasons for needing IPTrack's support of the Dynamic Host Configuration Protocol (DHCP). The standard addressing tool previously was unavailable for NetWare environments. Administrators say DHCP can better allot available IP addresses per client requests than the Bootstrap Protocol (BootP) server support provided by Novell, and DHCP can handle addressing for Macintosh stations and for PCs that run Windows 95 or Windows NT.

"We had a lot of conflicts with our BootP database when students left machines running overnight, hogging scarce addresses," said Patrick McEvilly, systems manager at the Kennedy School of Government at Harvard University. "It's easier for us to dynamically manage addresses for 600 nodes than to enter addresses in the BootP database for overnight processing," McEvilly said. "The users shouldn't have to care what their IP address is from day to day."

Support staff at Augustana College began passing out IP addresses via Novell's BootP NLM, "but it wouldn't work for [Macintoshes] and all the PCs," said Andy Barcus, network manager at the college in Rock Island, Ill.

On Technology
Cambridge, Mass.

PRODUCT:

IPTrack, software for centrally managing TCP/IP addresses throughout a Novell NetWare network

FUNCTIONS:

Lets managers assign and track IP addresses and automatically reassign inactive addresses. This NetWare Loadable Module implements the Dynamic Host Configuration Protocol to support Macintosh stations and PCs that run Windows 95 and Windows NT.

AVAILABILITY:

Shipping now. Priced per server: **$995** for 50 IP addresses or **$1,995** for 250 IP addresses.

Barcus already implemented IPTrack to avoid duplicating or running out of addresses for 750 nodes on four subnetworks. "Novell was on the right track, but On Technology beat them to it," he said.

Another beta tester preferred IPTrack for static address management. The University of Missouri School of Medicine in Columbia primarily supports diskless PCs with fixed addresses for each station, as required by mainframe access software for security. Ron Neely, computer project manager at the medical school, in August used IPTrack to manage addresses for 250 PC stations, as soon as bugs affecting NetWare 3.x were fixed.

"As the world migrates from SNA to IP networks, many shops will need the ability to map a particular network adapter to a user's name and location profile for secure host access," Neely said. "Since we're also migrating to Windows NT, which Microsoft embraces as a superset of BootP, we will kill two birds with one stone using IPTrack."

IPTrack is available from On Technology in two NLMs. One handles 50 IP addresses per server for $995, and the other tracks up to 250 IP addresses per server for $1,995.

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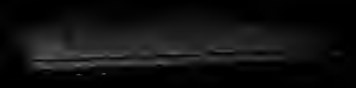

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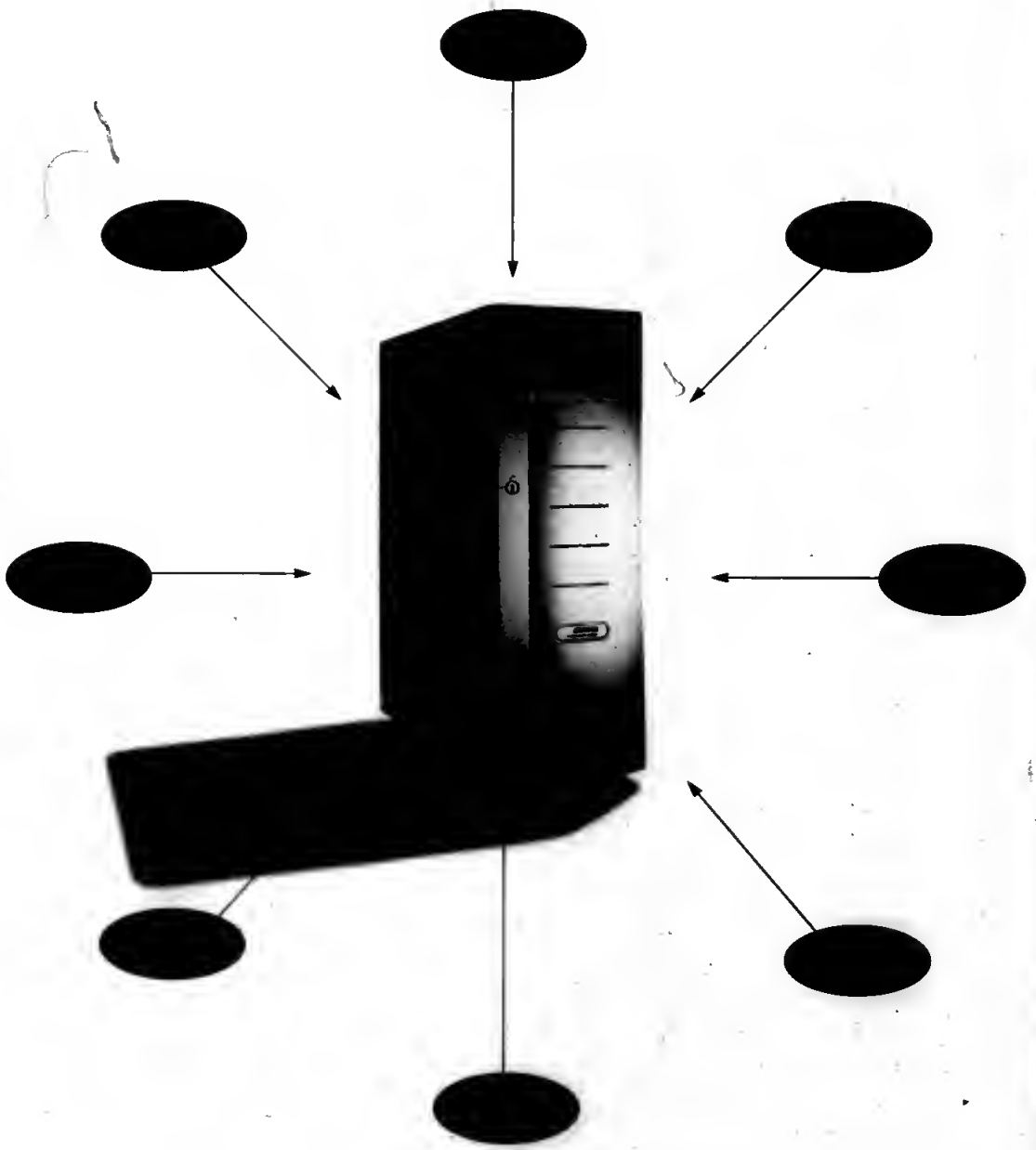

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Irate users

CONTINUED FROM COVER 1

were generally isolated. Today, they have an impact on enterprise networks and integrated LANs and WANs, where product mishaps are more likely to affect a company's bottom line.

"Users now have the business savvy to push for better deals and the technical savvy to know what products work and are strategic for their organization," said Eric Hindin, an analyst at The Yankee Group in Boston.

No regrets

Take Scoggin, for instance. The supervisor of network operations at Delmarva Power & Light Co. in Wilmington, Del., recently gave the heave-ho to his crop of legacy routers from Bay Networks, Inc. (formerly Wellfleet Communications, Inc.).

"It wasn't a hard decision to literally throw the Bay routers into the Dumpster," he said. "Bay tried to shaft us on pricing. They wanted to charge us about $400,000 to upgrade from the older Release 5.0 router software to the current release."

User issues

Delmarva at first appealed to Bay's top management, which refused to lower prices. So Delmarva turned to rival Cisco Systems, Inc. and got the deal it wanted.

"Cisco only charged us about $65,000 more for all-new routers," Scoggin added.

Jim Hourihan, vice president of marketing at Billerica, Mass.-based Bay Networks, last week said the situation with Delmarva was the exception rather than the rule.

"Bay hates to lose any customer, and we try to give the best deal for the dollar. We're fortunate we succeed in the majority of situations," he said.

Jumping ship

Thad Hymel, vice president of MIS at Hibernia National Bank in New Orleans, also switched his allegiance after eight months of trying and failing to get two Tricord Systems, Inc. Model 400 file servers to run Novell, Inc. NetWare System Fault Tolerance III (SFT III). The bank needed SFT III to ensure 100% uptime at its headquarters.

"We had invested $120,000 in the equipment and were assured the Tricord servers would run SFT. They were plagued with problems the entire time we had them, and the Model 400s don't run SFT III," Hymel said.

When confronted with the issue, Tricord was responsive and agreed to send Hibernia bigger server models that would run SFT III, he added.

"The only catch was Tricord couldn't deliver the models for another month. That was too long to wait, since we had already wasted eight months with the Model 400s," Hymel explained.

So Hibernia canceled the order and got two Compaq Computer Corp. Proliant 4500s delivered in two days.

"My users and Hibernia's customers are my top priority. They pay my salary, and I'll do what I have to do to make sure they're taken care of," Hymel said.

Ready to switch

Other users, such as Brad Errington, corporate LAN/WAN manager at General Nutrition Companies, Inc. (GNC) in Pittsburgh, live by a similar code.

Errington said in two instances last year vendors failed to deliver products as promised or the equipment never functioned properly.

While such occurrences thankfully are rare, Errington said GNC remains ready to switch products when a problem causes serious downtime and isn't addressed satisfactorily by the vendor.

David Marshall

"It might cost me my job if I didn't," he said. To avoid sticky situations, GNC sticks with tried-and-true products and has adopted a "once burned, forever warned" policy, Errington added.

An appeal

Bill Horst, chief at the General Services Administration's communications branch in Philadelphia, plays another brand of network poker.

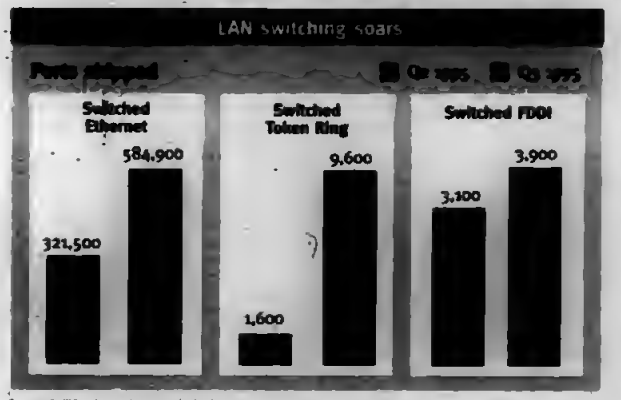
He pits current vendors against one or more competitors to get the best deal. "The key is to make sure your vendor knows that you're doing it — that you're ready and willing to throw all their products out the door — and give them time to respond," Horst said.

Late switches

CONTINUED FROM COVER 1

to deliver the promised switching modules. Instead, BHP awarded the contract to Bay rival Cabletron Systems, Inc.

BHP is the foremost example of a customer that couldn't wait any longer for Bay to deliver enhanced switching capabilities for its flagship enterprise switch.



Source: Dell'Oro Group, Menlo Park, Calif.

Once completed in March, BHP's project will internetwork about 2,000 users, making it the largest switching and Asynchronous Transfer Mode (ATM) installation in Australia.

What's the problem?

System 5000 switching slippages are also a concern for other users.

One German customer recently posted a message on the BayNet forum on CompuServe asking, "Why do you keep promising these switching modules and then not delivering?"

Bay's Hourihan declined comment on the reasons behind the repeated delays. For System 5000 users who need segment switching capabilities now, he said, "We'll address users concerns on an individual case-by-case basis."

The System 5000 does have basic, first-generation port-level switching and recently began shipping an ATM switching module.

The latest timetable for the arrival of the other LAN segment switching modules includes the following:

- Between June and September, Bay will release the 10M bit/sec. switched Ethernet and 16M bit/sec. Token Ring switching modules that provide links to ATM backbones. Those modules will be based on technology Bay acquired as part of its acquisition of Centillion Networks.
- In the fourth quarter, Bay will deliver 100M bit/sec. Fast Ethernet modules.

Analysts are especially perplexed about the switching setbacks since Hourihan categorically denied rumors of problems with the ASIC semiconductor chips.

Similar ASIC problems plagued the LattisSwitch System 28115 stand-alone lower-end switching hub for several months last year.

Hourihan insisted that only a handful of customers have immediate need for high-end switching.

"Close to 100% of our customers bought the System 5000 for its strength as a high-end, shared-media hub, with the security blanket that backbone switching capabilities would be delivered in the future," he said.

Tam Dell'Oro, a principal at the Dell'Oro Group in Menlo Park, Calif., disputed the notion that users aren't clamoring for high-end switching.

Ethernet switching shipments alone "have risen over 200% in the last year, and we expect worldwide switching revenue to be a $4.8 billion industry in 1996," she said.

"To date, Bay is the only one of the 'Big Four' switching hub vendors [whose ranks include Cabletron, Cisco Systems, Inc. and 3Com Corp.] to not have segment switching capabilities for its enterprise hub platform," said Eric Hindin, an analyst at The Yankee Group in Boston.

"That begs the question, 'Why would anyone buy a switching hub that doesn't do segment switching?'" he said.

The delayed switching timetable also worries analyst Charles Robbins at Aberdeen Group, Inc. in Boston. He said Bay's continued delays "are giving them a big black eye."

Managing internetworks should get easier this year. See page 53.

value

pricing [illegible] features

With HP PCs,

[illegible]

which comes first.

from

$1,679*

HEWLETT PACKARD

Briefs

SGI alerts investors to revenue drop

Silicon Graphics, Inc. (SGI) took a beating on Wall Street last week after announcing lower-than-expected revenue for the last three months of 1995. Mountain View, Calif.-based SGI, which makes graphics hardware, estimated that revenue rose to $675 million, from $550 million the year before. But profits fell to 30 cents per share, from 34 cents in the same quarter of 1994. A record sell-off triggered a 20% drop in SGI's stock price.

Intel settles UMC chip suit

Intel Corp. last week settled a suit with chip maker United Microelectronics Corp. (UMC) in Taiwan. Under terms of the agreement, UMC will discontinue making, using or selling its version of the 486 microprocessor. It also will pay Intel an undisclosed amount of money as part of the settlement.

Borland shuffles board of directors

Philippe Kahn has resigned as chairman of Borland International, Inc.'s board of directors effective last week. He will remain on the board. He was replaced by William F. Miller, 70, a professor at Stanford University and the former president and CEO of SRI International. Also appointed to the board was Harry J. Saal, 51, chairman of Network General Corp.

SHORT TAKES Larry Jordan, formerly with FileNet Corp., has become president and chief operating officer of Transbotics Software Corp. in Huntington Beach, Calif. He replaces President C. Stephen Jenkins, who will refocus on product planning, development and marketing activities.

AT&T breakup to take heavy toll

By Neal Weinberg

Information systems will take one of the largest hits as AT&T Corp. eliminates 40,000 jobs and takes a $6 billion pretax charge to cover the cost of splitting into three independent companies.

The company announced last week that IS, human resources and financial operations will take the brunt of about 10,000 company-wide staff jobs that will disappear when AT&T splits into a telecommunications services company, a telecom equipment company and a computer company.

The cuts include the following: layoffs of 30,000 workers over three years, a buyout package for 6,500 managers and the loss of about 4,000 other workers who are part of the units the company plans to sell. An additional 8,500 workers will be laid off at AT&T Global Information Solutions.

AT&T's attempt to slim down to a fighting weight in anticipation of telecom deregulation was viewed in a generally positive light by users, analysts and Wall Street investors.

Under the plan, AT&T GIS, the former NCR Corp., will be spun off into an independent computer company.

A public stock offering will take place this spring to raise capital for an as-yet-unnamed equipment company that will also become an independent entity. And the bulk of the company's activities in telecommunications services will continue under the AT&T banner.

The move was designed to allow each company to compete in its own marketplace, unfettered by being part of a larger conglomerate.

"If they didn't do this now, they would not be competitive in the new marketplace, and more than 40,000 jobs would be at stake several years from now," said Jeffrey Kagan, president of Kagan Telecom Associates in Atlanta.

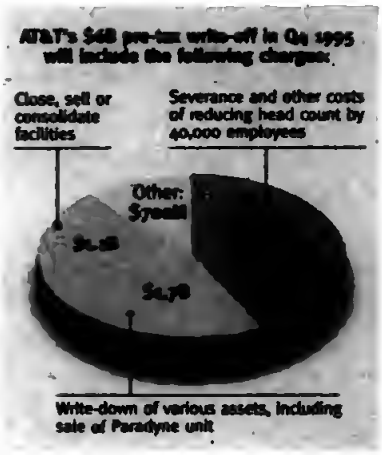
The $6 billion pretax charge will reduce calendar fourth-quarter profits by about $4 billion.

The company earned $2.82 billion in the first nine months of 1995.

"I do see this as a positive thing," said Linda Tratnik, president of AT&T's Software Defined Network user group. "Everyone needs to be leaner and more competitive."

Paul Hoogenboom, director of communications at A. W. Chesterton Co. in Stoneham, Mass., said he isn't worried about the layoffs affecting the service he receives from AT&T. That is because he expects the cuts to fall primarily in middle management.

Once the trivestiture is completed, Tratnik said she anticipates faster deployment of new services for users, who are clamoring for global connectivity in areas of voice, data and cellular communications.



Downsizing

With the latest layoffs, AT&T has cut 125,000 jobs in the past decade. The company has 300,000 employees.

Revamped Gupta pursues profitability

By Frank Hayes

In one fell swoop, a struggling Gupta Corp. last week replaced its CEO and shed one-sixth of its employees in an effort to become profitable again.

Gupta in Menlo Park, Calif., also will change its name to Centura Software Corp. after it introduces a 32-bit client/server development system named Centura, sources said. Centura is scheduled to ship by June.

Umang Gupta, the development tools company's chairman and co-founder, stepped down as CEO. He was replaced by Sam Inman, the longtime IBM executive who took over as president and chief operating officer in April 1995. Gupta will stay as chairman until May and then remain on the board of directors as the company's largest stockholder.

"We are singularly focused on getting to be profitable soon," Gupta said. He said the company has laid off about 60 of its 360 workers, mostly in areas such as sales and marketing. The layoffs will result in about a $9 million charge against Gupta's earnings for the last three months of 1995.

That is expected to be Gupta's eighth consecutive money-losing quarter, despite continuing efforts to cut costs and increase sales. Sales of the company's flagship SQLWindows development tool set rose to $35 million in 1994 from $21 million in 1993, according to International Data Corp. in Framingham, Mass. But Gupta still lost more than $20 million in 1994 and lost $8.7 million in the first three quarters last year.

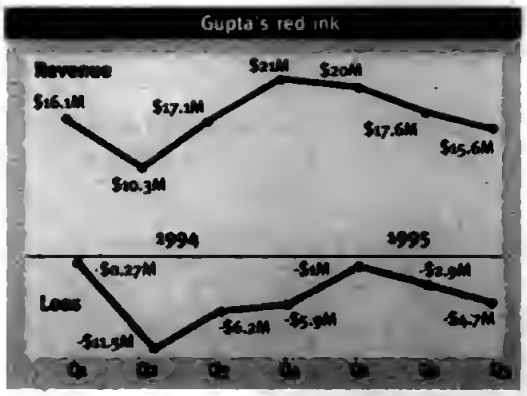
Gupta has excellent technology, but it has never been able to build solid relationships in key distribution and consulting channels, said Melissa Eisenstat, a vice president at Oppenheimer & Co. in New York.

Gupta and Inman insist the company isn't being streamlined for a future sale. But customers and analysts think it likely.

"We've known Gupta has been struggling financially for a long time," said a user at an Atlanta consulting organization. "But the tools are so strong that even if [Gupta] goes to pot, somebody's going to buy them."

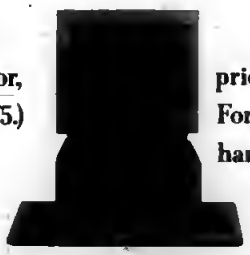
Inman has "certainly got [the best] chance to get the thing in shape to be sold," Eisenstat agreed. "But on its own, I just don't see how it can continue."

"I think [the reorganization] is a positive development for current Gupta customers," said Dave Kelly, an analyst at Hurwitz Consulting Group, Inc. in Newton, Mass. "They certainly are better set up to be purchased by another company if they continue to lose money, and their current customers are content to ride out a little bit of roughness in terms of Gupta's corporate stability."



{ The decision-making process }

{ The decision }



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[1]Average street price for entry-level model with 75MHz/540MB HDD and 8MB RAM (no L2 cache). Monitor not included. Dealer prices may vary. [2]M - F, 8am - 8pm EST. In Canada, call IBM's HelpFax at 1 800 465-3299 (ask for document # 45215). [3]IBM's Statement of Limited Warranty is available by calling 1 800 772-2227. [4]Hardware support during warranty; preloaded operating system support for 60 days; excluding some holidays. IBM is a registered trademark and NetFinity is a trademark of International Business Machines Corporation. Pentium is a registered trademark of Intel Corp. *© 1995 IBM Corporation.*

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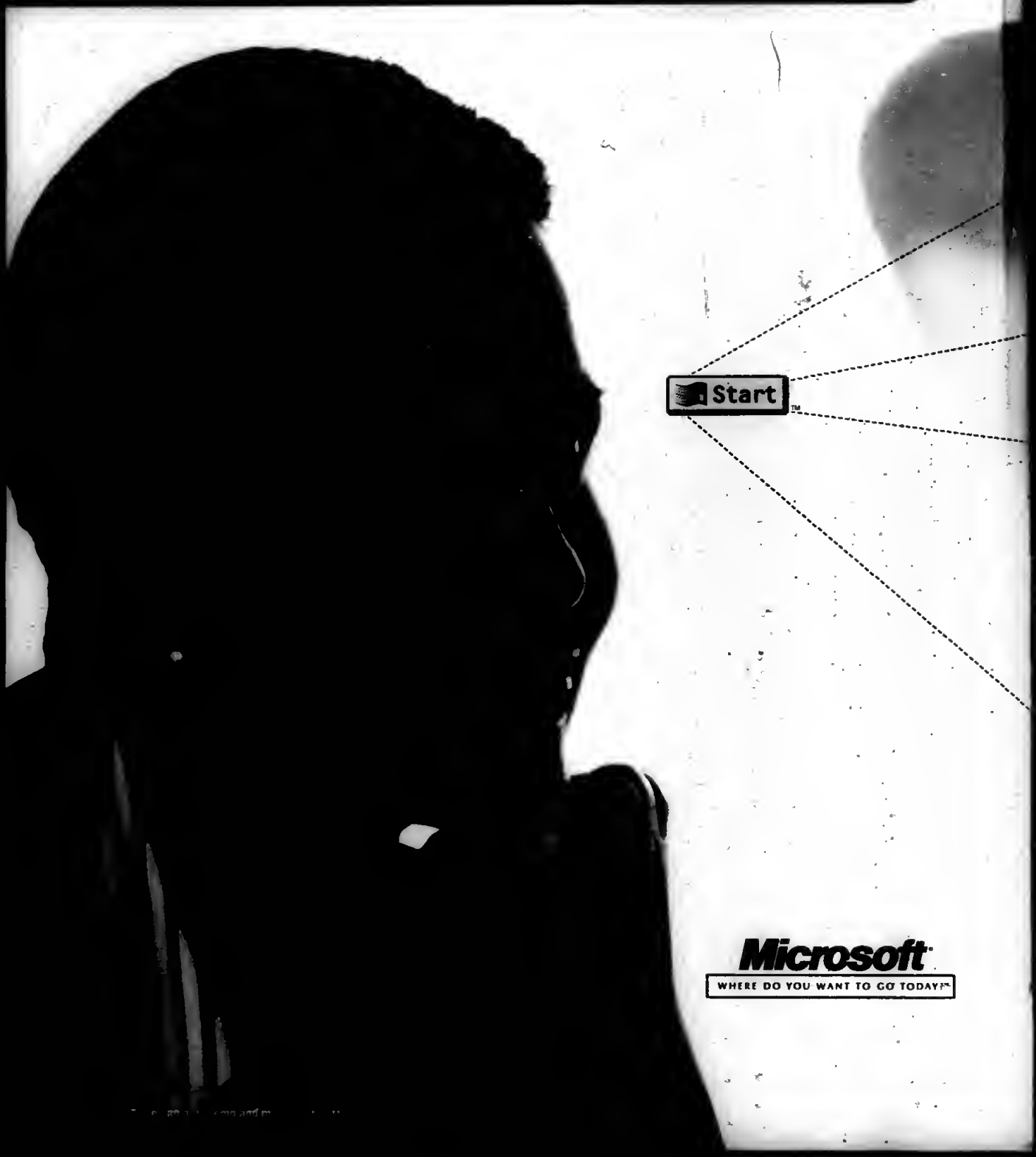

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Changing to meet your needs

Throughout the second half of 1995, we introduced a number of changes in our format, each designed to make the time you spend with us more fruitful.

We buffed up the table of contents, color-coding it to match the green, red and purple page tabs we added. We expanded our use of informational graphics. We shortened our stories with tighter editing and writing without sacrificing content. We added little signaling devices designed to tell you immediately what a story is about. We reduced the physical size of *Computerworld* a bit to make it more portable.

We're at it again, all for you.

There was one very big, yet very subtle, change we snuck into the paper a month ago. We changed the predominant feature of any publication — our typeface. Today, we feature a tried-and-true typeface called Century Old Style; it's as familiar to most people as a favorite photograph and just about as easy on the eyes. This change was designed to help speed you through our stories.

This week, we are premiering two other changes.

The first is a complete overhaul of our technical sections. These begin on page 39 with the **Servers & PCs** section, which features trends and analysis pieces on large systems, workstations and portable computing.

The other new sections follow: **Software** (client/server apps, development tools and operating systems); **The Enterprise Network** (LANs, WANs and network management); **The Internet** (the Web, intranets and on-line services); and **Corporate Strategies** (case studies and trends).

We changed the sections for just one reason: to make it easier for you to more quickly find the reading selections that interest you most.

Finally, see our new ALT.CW page. It will immediately follow our contents page every week, starting with this issue. Call it our iconoclast page or our fun-and-brains page. It was designed to ease you into what we hope will continue as your primary source of information for getting your job done.

Your comments on these changes and suggestions for others are always welcome. See my address below.

Bill Laberis

Bill Laberis, *Editor*
Internet: *bill_laberis@cw.com*

The mystery of SAP explained

Regarding the letter "How do I become a SAP" [CW, Dec. 4], I thought I'd send you some information. I became a SAP myself in 1993.

Besides being eligible for lavish pay raises and certificates that you can hang over your desk, a SAP can get official logo SAP coffee mugs, golf hats, T-shirts and book bags. Your manager will break out in a cold sweat of concern when he sees you wearing all that stuff.

So, why not become a SAP? Just a bit of advice: It's not easy. You'll have to attend many training sessions, work long hours and understand some German. And after it's all said and done, you'll realize that you still haven't learned everything there is to know about how to be a good SAP. Sounds intriguing, doesn't it?

Call 1-800-USA-1SAP for more information, or try the SAP [World Wide Web] site: http://www.sap.com.

Kevin Lammers
Kevin.P.Lammers@CPMX.SAIC.COM
San Diego

I read the letter from Don P. Plum in which he asked what the definition of SAP was, and I was eager to read your answer. I also don't know what SAP is. But after finishing his letter and searching the page (and several nearby), I couldn't find the definition. Is it so simple that we all should know it?

I would appreciate it if you would publish the definition so those slightly behind the technology curve would be enlightened.

Art Malin
Kootenai Electric
Hayden, Idaho
malina@hec.com

Editor's note: Glad to oblige. SAP AG is a leading vendor of financial applications software for client/server environments. Its SAP America, Inc. subsidiary leads this market category in the U.S. SAP technical skills are red-hot right now.

Creativity lives

In his column, Marc Gunderson dredges up the weary argument that the wonders of the technology world threaten our intellectual and creative skills ["We're losing our creative minds," CW, Dec. 4]. He fails to credit humankind for our intense creative drive. The invention of the abacus didn't stop us from putting a man on the moon, and the advent of the automobile didn't stop athletes from breaking the 4-minute mile.

Tools provided by technology, from the hammer to the latest computer-aided design programs, enhance our ability to innovate and let us exceed what were once considered the boundaries of creation. Machines will never do it all, as the author contends, because we will never be satisfied; it's not our nature.

Patrick Elmore
Des Moines, Iowa
pelmore@ix.netcom.com

I have seen the exact same gloom-and-doom article written in 1905 about the dangers of electricity. The damn stuff can kill you.

I suppose if you need to fill the space you can find at least six naysayers for one who predicts something good will happen.

Don Howard
San Jose, Calif.
103200.544@compuserve.com

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor-in-Chief, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Verbatim

From a Forrester Research, Inc. report on IS outsourcing by analyst Christopher M. Leuchtenberg:

Power remains in the hands of outsourcers, developers and consultants, not users. At the outset of an outsourcing deal, corporations bring in the big guns to select vendors and negotiate contracts. But after the contract ink dries, an inexperienced IS manager gets to match wits with the outsourcer's battle-hardened veteran. Guess who wins.

Companies don't spend enough on managing their [outsourcing] providers. The big bucks spent on high-priced lawyers and consultants to negotiate the initial contract are wasted when the ongoing relationship is watched over by a low-level, low-paid manager. Users should plan to spend some 5% to 10% of the contract value on managing [the outsourcing vendor]. They should start by assigning an IS executive [who has] experience managing outside help to drive the ongoing implementation.

From a statement by Robert Holleyman, president of the Business Software Alliance, urging reform of the U.S. export controls on encryption software:

It has been three years since the U.S. permitted the export of mass market software programs with moderate encryption (i.e. with 40-bit keys). At that time, the government committed to reviewing and increasing the key length . . . [but] this commitment has been ignored. Yet there is a clear need for an immediate increase in key length. Customers are demanding increased security. The 40-bit encryption used by Netscape Communications Corp. was broken [this summer by French hackers. . . .

Moreover, commercially available arrays of chips dedicated to encryption make attacks much faster and cheaper. Quite simply, 40 bits is no longer viable security and [can't] be marketed by [U.S.] companies as security.

Keeping the wolves at bay

Stuart J. Johnston

When I was a teen-ager in Cut Bank, Mont. — the small, frigid, windblown prairie town where I grew up — the thing to be was a member of the varsity basketball team.

The Cut Bank Wolves consistently fielded the state Class B basketball champions.

Unfortunately, I wasn't tall enough to play basketball. So when I was a high school senior, I landed a job as sports reporter for the local newspaper, *The Pioneer Press*.

My job was most exciting during basketball season, and strange as it might seem, those experiences taught me a very valuable lesson about business — particularly the fast-moving computer industry.

A high school sports lesson for industry chieftains: Keep your eye on the ball.

Fixed concentration

Although it sounds cliched, the best players always kept their eyes and minds on the ball, to the exclusion of everything else. Sure, they paid attention to the competing players, but that wasn't their central focus.

When you have the ball and are surrounded by competitors, if you aren't paying attention to the ball first and foremost, someone will take it away from you.

But just having the ball isn't enough. You have to score, which means you have to pay attention to executing plays and making each shot your best. Teamwork also is important, but the key to winning is in never letting an opposing player distract you from focusing on the ball.

Because of the Wolves' champion status, every team they played against had it in for them.

You could see the concentration on the opposing players' faces as they walked on the court. There often were fistfights on the court, frequently started by opposing players who felt the Wolves were cheating or the referees were biased.

Psyching out

Years later, I realized the main reason the Wolves won so often: Competing teams often had equally good players, but ultimately they were worrying about beating the Wolves more than they were focusing on the ball.

The competitors rarely realized that they were distracted from the real focus. And when a competing team did grasp that fact, they often could beat the "unbeatable" Wolves.

Lessons learned

Now, I said at the start that I learned an important lesson about business from covering those games. Of course, nothing is ever as simple as you must portray it in a column, but the lesson is this:

In the preceding story, every time you see the word "ball," replace it with the word "customer." Every time you see the name "Wolves," replace it with the name of any exceptionally successful company, such as Microsoft, Intuit, Hewlett-Packard or IBM in its heyday. Replace the words "competing team" and "opposing players" with the names of companies that may have great technologies and great people but often seem to come up short.

I think you see what I'm getting at.

By the way, the only game the Wolves could ever win consistently was basketball. That fall's football season was a complete disaster, and the team lost every single game. I suppose that means that great abilities in one sport don't necessarily guarantee a winning team in another.

Hmm, maybe there's a lesson in there, too.

Johnston is a senior editor in *Computerworld*'s Pacific Northwest bureau. His Internet address is stuartj@cw.com

IS auditor: Friend or foe?

Martin S. Smith

"Why do you want to examine that?" "You want security access to what?" "We can't do that without more resources."

Those are the common responses to my requests for more information from IS professionals about their projects. You see, I'm an IS auditor. I'm also growing a thick, scaly hide and have long fangs and fiery breath. At least that is how some people perceive us auditors: the beast, the monster, the foe, the enemy from within.

We aren't "the enemy from within." IS auditors can be helpful "consultants."

I've seen the IS/auditor relationship from both sides of the fence; I worked in IS development for 10 years before becoming an auditor. Not everyone sees us as a foe. Some IS professionals understand what IS auditors are trying to accomplish. Aside from generating a huge amount of information during an audit, we evaluate the integrity, reliability and security of data processing systems.

Amicable outlook

My goal isn't to make IS people uncomfortable, get them into trouble or get them fired. My goal is to collaborate with the systems developers to ensure that a secure, reliable data processing system is built. I prefer an atmosphere of trust, truth and mutual assistance.

Assistance? From an auditor? Shocking, isn't it? For example, during an audit, we may point out the need for additional personnel to complete important security-related tasks. Many project leaders or managers would love to have us document that need in an audit report. After all, who doesn't need extra staff given all the downsizing nowadays?

In fact, maybe it would be better to think of us as IS consultants who bring a particular set of skills to the team. Ideally, we'd be involved in systems development from the very beginning because it is better and cheaper to build in security and reliability from the outset than to try and retrofit them at the end.

I know some people are reluctant to let auditors sit at the IS table early on because they fear the project will be nitpicked to death. But auditors provide an independent analysis that can save the company a lot of hassles, financial losses and embarrassment.

Given the reports of computer abuses and IS project boondoggles, maybe having someone ask, "Is this $10 million system properly planned out?" isn't such a bad idea. As an official at the Information Systems Audit and Control Association put it, "You need somebody independent of the programmers to assess the integrity, reliability and controls of the system."

We want to help! We really do want to see new information systems implemented. Our goals are the same. We, too, want to empower the user community — in a secure and reliable manner, of course. Given a choice, I think we'd rather be impressed by what we examine than distressed by the omissions. We would be very happy to report (and we have done so) that computer operations and administrative functions are well-controlled and well-managed.

My message to IS developers is simple: Auditors aren't your enemy. We want to work with you, not against you. We have some extra requirements, but we're no more demanding than end users. We can be allies.

Smith is a senior electronic data processing auditor at Pennsylvania State University in University Park. His Internet address is mss3@oas.psu.edu.

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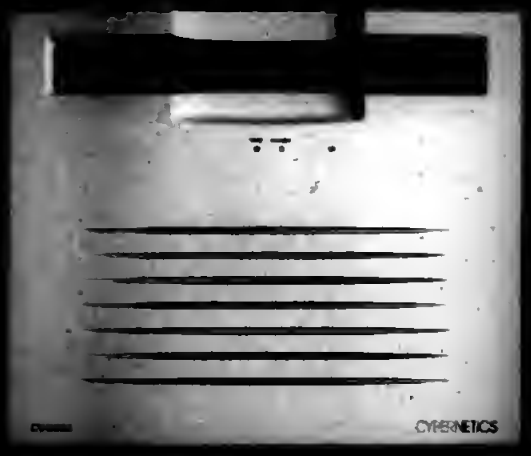

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* Sentry Market Research

** All drives, except VHS, are available with data compression

The cost of system time varies from site to site, but a recent study has put the cost of a medium sized PC LAN at ***$18,000 per hour*** — and the cost of a UNIX network at ***$30,000 per hour.*** * Numbers like that make it easy to understand how a backup/restore solution that can do its job faster can save you serious money.

For example, for a single 40 GB restore, the CY-9000 will save you...

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INTEL UPDATES CHIPS FOR PENTIUM PRO SERVERS, 42
THINKING MACHINES SYSTEM WILL GROUP WORKSTATIONS, 42

Meeting the data storage challenge

Managers cope with more networks, higher requirements

By Bob Francis

For IS managers dealing with the explosion of data on LANs and WANs, the promise of a well-ordered, tightly structured hierarchical storage management system seems out of reach — at least at a company-wide level.

But some information systems managers at the departmental level are learning to make it work, even if it doesn't look pretty.

At the same time, IS managers are dealing with an ever-growing sea of data. Analysts estimate that storage needs for LAN servers will increase to 11,096T bytes this year, up from 5,203T bytes last year. By 1999, that figure should increase to 59,661T bytes, according to International Data Corp. (IDC), a research company in Framingham, Mass.

"A few years ago, we had servers with 2G bytes storage capacity, and we thought we had it licked," said David Blanchard, a systems analyst at Quaker Oats Co. in Chicago.

Now the average server in Quaker Oats' home office gobbles up 8G bytes, with more demands being made on the systems daily.

To help cope with this explosion, Blanchard has added RAID storage systems to his Intel Corp.-based servers from Digital Equipment Corp. to reduce server downtime. "Before, we were having to take the servers down when a disk drive went bad, but now the servers are so essential, you simply can't afford to do that," he said.

Closer Look
STORAGE MANAGEMENT

The RAID systems, from Storage Dimensions, Inc. in Milpitas, Calif., also include Vantage Point, the storage vendor's system administration package. "That way we can monitor what's going on at the RAID systems from our network control center, so if a disk drive goes down, we can go replace it," he said.

Quaker Oats is monitoring LAN sites only, but Blanchard said he hopes to include some remote sites across the WAN in the next two years.

Drowning in data

Like many other IS managers, Blanchard foresees higher storage requirements in the near future, but he said he wants to avoid being drowned by the data tide. Technologies such as high-powered application servers and server clustering sound great, he said, but the tools aren't available to help manage the additional storage complexities of such tasks.

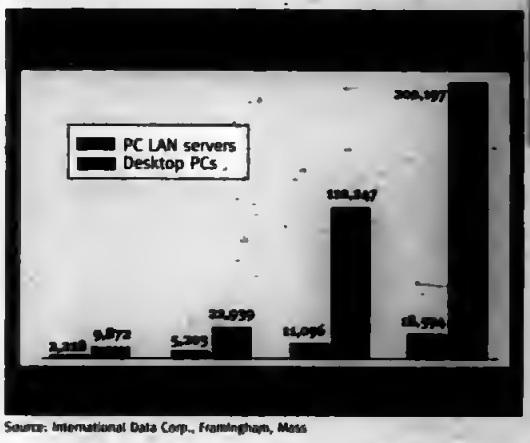
To shift these servers from file- and print-sharing to hard-core applications will require changes to increase stability and reliability of networks.

"RAID gets us half the way there, but we need to see more error-correcting code, server clustering and more fault tolerance before we put data out there [that] we can't afford to lose," Blanchard said.

While many users remain tied to file and print servers, some customers have designed systems to handle large volumes of data over networks using optical technologies.

At an R. R. Donnelley & Sons Co. division in Harrisonburg, Va., systems engineer Dan Everard is using an optical jukebox combined with hierarchical storage management software for his large data needs.

R. R. Donnelley's network deals with large amounts of text that change very rarely, so the optical jukebox keeps the files available. "We migrate files from the hard drives to the 80G-byte jukebox and then to tape with 140G bytes of storage," Everard said.



Source: International Data Corp., Framingham, Mass

Donnelley's application, like the one at Quaker Oats, is limited to a single Unix-based network. That may continue to be the rule rather than the exception as long as data requirements continue to increase, Blanchard said.

High-volume RAID

High-volume applications lend themselves to RAID systems as well. At Datamatx, Inc., a print and mail service bureau in Atlanta, senior program manager Michael Sanders searched for a RAID system designed for a small but high-volume network.

He chose a RAID system — the CR6 RAID 5 array — from Conner Peripherals, Inc. "The RAID system is essentially the heart of a system that takes data from customers and does large laser printing and mailing operations," he said.

The RAID system serves a small network with about 30 PC clients but with 4G bytes of storage and rapid turnover. "I don't think most companies realize how much critical data is out there even on smaller networks," Sanders said.

Robert Grey, an analyst at IDC, said the problems are too large to tackle on a company-wide basis. "The data is growing so fast that most companies simply can't get their arms around it on a corporatewide level," he said.

Benefits from network-attached storage systems abound

Storage systems are making new attachments.

Most large storage systems, such as RAID systems, are connected to servers that provide CPU power, processing and management functions. But many vendors are working to link storage systems directly to networks.

Benefits to this approach include higher performance and more flexibility. Network-attached storage subsystems provide their own processing, freeing the host for other tasks, and they can be accessed from any server or node on the network, said Ron Engelbrecht, director of product development at Symbios Logic, Inc., a RAID controller and storage system provider in Wichita, Kan.

Another advantage over CPU-attached systems is the ability for users to share the information that resides on the storage device: A network-attached storage system can share resources with several hosts. Finally, network-attached storage doesn't waste CPU power.

The systems can be attached to a network or networks at any point, giving some flexibility to the network's design.

Several vendors, including Tricord Systems, Inc. and Network Appliance Corp., already offer network-attached storage systems. But Engelbrecht said he expects the systems to really take off next year with the growth of high-speed interconnects such as the 100M byte/sec. fiber channel and 100Base-T Ethernet. "Those higher speed connections make more sense for network-attached storage," he said.

On the ball

And it won't be just a myriad of RAID systems providers in the market, either. Hopkinton, Mass.-based storage honcho EMC Corp. plans to enter the market. The company purchased McData Corp. last year, partially for some network-attached storage technology developed by the Bloomfield, Colo.-based company.

According to Farid Neema, president of Peripheral Concepts, Inc., a research group in Santa Barbara, Calif., network-attached storage offers several advantages over current storage systems that are attached to other network hosts.

These benefits include high availability — network-attached systems don't depend on the availability of the host's processor — and more effective storage management because the storage system can be managed as its own device on the network.

One caveat, however, is cost. Unlike current storage systems that are basically priced by the megabyte, network-attached storage costs more than CPU-attached storage because of its additional processing and systems management capabilities. Analysts said a network-attached storage system generally costs about 20% more than a comparable host-attached RAID system.

The price differential may not trouble some IS managers. "I used to measure how I buy my storage by cost per megabyte," said Dave Blanchard, systems analyst at Quaker Oats. "Now I add in how much it's going to cost me to manage that storage," he said. — *Bob Francis*

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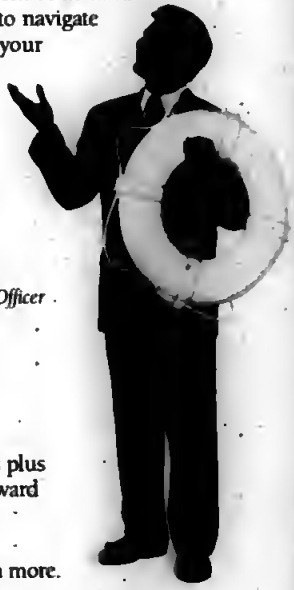

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Intel updates chip set for Pentium Pro servers

Improved throughput expected in symmetrical configurations

By Jaikumar Vijayan

Intel Corp. has begun providing manufacturers with sample quantities of an updated version of its Orion Peripheral Component Interconnect (PCI) chip set for Pentium Pro servers. That means users can expect to see symmetrical multiprocessing (SMP) servers based on this chip by the end of the first quarter.

The chip set is expected to resolve the problems noted in published reports about the inability of Pentium Pro systems to achieve full PCI throughput in SMP server configurations.

Resolution of these problems will be good news for users such as David Greenberg, chief technical officer at Visteon Corp., a provider of outsourcing services to the Orlando Healthcare Group in Maitland, Fla. "We would like to see some more maturity, and we would like to see more endorsement of Pentium Pro servers by top-tier vendors," Greenberg said.

But the early reports of Pentium Pro-related performance issues aren't stopping the company from evaluating SMP servers based on the chip. "Such problems are typical with any new processor generation," Greenberg said. "For us, the real issue is of price/performance."

SMP server surge

Vendors planning to release quad-processor SMP servers include Dell Computer Corp., Hewlett-Packard Co., Compaq Computer Corp. and IBM. Some vendors, such as Data General Corp., AST Research, Inc., Unisys Corp. and Acer America, Inc., have already announced servers based on the Pentium Pro but haven't yet started shipping them in volume.

Plenty of Pentium Pro

A sample of vendors that have announced Pentium Pro servers and workstations

Vendor	Product
Dell	Dimension XPS Pro 150
IBM	IBM PC 300
Hewlett-Packard	Vectra XU and VT
AST Research	Manhattan
Data General	Avilon

The first quad-processor server systems are expected to be based on the 0.35-micron, 166-MHz Pentium Pro. The chip, which has a 512K-byte second-level cache, has been optimized for SMP configurations. Santa Clara, Calif.-based Intel also will upgrade its 200-MHz Pentium Pro chip with a 512K-byte cache. That chip is expected out in the second quarter, and servers based on it will ship in the second half of the year.

Meanwhile, several manufacturers are expected to start widely shipping Windows NT-based Pentium Pro "personal workstations" in the first quarter. Most of the major vendors, such as IBM, Compaq, HP and Dell, have already announced high-end desktops based on 150-, 180- and 200-MHz Pentium Pro chips.

These high-end desktops, which are basically workstations with more memory and larger hard disks, have been getting favorable reviews from some early customers of Intel's worldwide user test program. The company launched the program in the fall.

James Horner, a Los Angeles-based composer of music for movies such as *Jumanji*, *Casper* and *Clear and Present Danger*, used the Pentium Pro for creating special sound effects.

"It takes a tremendous amount of processing power to be able to do the things I do. The Pentium Pro has it," Horner said. It used to take up to 10 minutes to make a change to the special effects, which are created by manipulating digitally stored sound. With a Pentium Pro workstation, it takes three minutes, Horner said.

"It appears to be very snappy when running our kind of applications," said Linda Rudawitz, MIS manager at Holmes & Narver, an architectural firm in Orange, Calif. The firm, which designs bridges using several computer-aided design applications, is using a 133-MHz Pentium Pro-based reference system from Intel. It has 32M bytes of RAM, a 1.5G-byte hard disk, 2M bytes of video RAM and 64-bit graphics.

Thinking Machines server will combine Sun Unix workstations

Up to 64 stations supported, linked by ATM or fiber channel

By Jean S. Bozman

Thinking Machines Corp. plans next month to ship a parallel server that combines dozens of off-the-shelf Unix workstations from Sun Microsystems, Inc. into a single computing system.

It will compete against IBM's SP parallel processor, analysts said.

The GlobalWorks Server is built with Sun Ultra 1 64-bit systems and Sun's Solaris 2.5 Unix. It was demonstrated at the Supercomputing '95 show in San Diego late last year.

The server can support up to 64 workstations — 10 workstations to a cabinet — all linked by a high-speed Asynchronous Transfer Mode (ATM) or fiber-channel network. Units can be scattered over a corporate campus.

"The idea is to create a single system image on top of a distributed cluster," said Jacek Myczkowski, vice president of development and technology at Thinking Machines in Bedford, Mass. The $500,000, 16-node GlobalWorks server will ship next month — just as Thinking Machines emerges from Chapter 11 protection, he said.

The GlobalWorks middleware assigns computing tasks to all the networked processors. For batch jobs, the middleware is similar to distributed computing software from Platform Computing, Inc., analysts said. But for collaborative work on parallel processing problems with a single system image, it is similar to new meta-computer software being tested with Unix workstations in ATM networks [CW, June 5].

Link options

The workstations can be linked through ATM, fiber-channel networks at 25M bits/sec. or Fast Ethernet networks at 100M bits/sec.

Joint marketing plan

In November, Sun signed an agreement with Thinking Machines to jointly market the GlobalWorks unit.

Sun is preparing a set of technical symmetrical multiprocessing servers based on the 64-bit UltraSPARC chip, said Siamak Hassanzadeh, a project leader for Sun's high-performance computing group.

After Thinking Machines went into Chapter 11 last year, Sun hired about 30 Thinking Machines engineers to develop future products. Details of that project haven't been announced.

Sun's move with Thinking Machines is overdue, some said. "They have not had a strong presence in performance clustering," said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

IBM's SP leads in massively parallel processor (MPP) clustering of workstations, and Hewlett-Packard Co. is working with its Convex division to build MPP machines, Iams said.

But so far, parallel servers haven't become mainstream products largely because software that takes advantage of such architectures is in short supply, analysts said.

Target markets include seismic analysis, scientific simulations and data mining. End-user organizations to tap in to the parallel server phenomenon include oil companies and automobile companies, which lead in assigning tasks to networked Unix workstations, said Christopher Willard, an analyst at International Data Corp. in Mountain View, Calif.

GlobalWorks Server

Typical configuration: 16 nodes
Hardware: Up to 64 Sun Microsystems Ultra 1 64-bit workstations
Software: Solaris 2.5 Unix operating system
Performance: Up to 5 billion floating point operations per second for a 16-node system
Price: $500,000 for a 16-node system with 32M bytes of node memory; ships in February

Briefs

Parallel growth

The Palo Alto Management Group projects that the market for parallel processing systems will increase at 40% per year through 1999. By then, annual parallel processing sales should top the $14 billion mark, the consultancy predicted in a recent report. The development of third-party software for parallel processing has helped reduce implementation hurdles, the report said.

Hitachi updates operating system

Hitachi Data Systems Corp. in Santa Clara, Calif., has announced HI-OSF/1-M Release 2.0, a new release of its Unix operating system for use with HDS' IBM-compatible mainframes. Release 2.0 sports enhanced network administration, Network File System file serving and security features, company officials said.

Pixel licenses technology

Adobe Systems, Inc. beats up its Acrobat Capture software by licensing Pixel Translations, Inc.'s scanner tool kit. Acrobat Capture converts paper documents to Adobe's Portable Document Format. Users will be able to access specific functions for up to 130 scanners and interface cards. Pixel also will supply the image viewing and printing features for Lotus Development Corp.'s image viewer and Print-to-Fax driver.

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HANDLING CAPABILITIES, 48

Software

CLIENT/SERVER APPLICATIONS • DEVELOPMENT TOOLS • OPERATING SYSTEMS

Oracle takes a risk with suite

By Dan Richman and Suruchi Mohan

Oracle Corp.'s recently announced InterOffice Suite promises more features than competing products, but some skeptical analysts and users fear such a comprehensive package may be hard to sell and deliver.

"It definitely promises a lot," said Rich Malone, chief information officer at Edward D. Jones & Co., a St. Louis financial broker. "It sounds like a very complete package, and I'm intrigued — but it's also quite complex and ambitious."

Mark Levitt, a senior analyst at International Data Corp. in Framingham, Mass., agreed that Oracle has its work cut out for it. On several occasions Oracle has flamboyantly announced products only to quietly fold them soon thereafter, Levitt said. Two examples are Oracle Documents, a document-management program that was never released, and Oracle Card, a development tool that was released but flopped.

This might be the fate of Oracle InterOffice, too, as it represents an attempt to diverge from Oracle's well-established competence as a relational database management system vendor, Levitt said. Rather than going against its traditional DBMS competitors, with InterOffice Oracle would be fighting new enemies: messaging and groupware ven-

Oracle, page 48

Oracle's InterOffice Suite

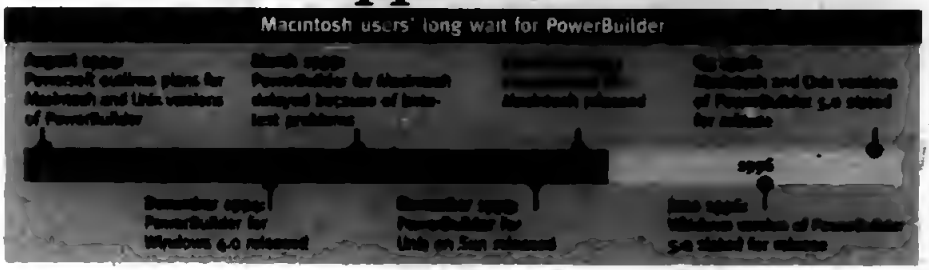
What it is: A client/server package that includes:
- Oracle7 RDBMS
- Centralized administration and application distribution
- Fax, voice mail, calendaring and group-oriented document handling

Where it will run and when: A MAPI-compliant client will run under Windows, on Internet browsers and on some telephones. Server will run under Windows NT and Solaris by Intel by April 1 and under all Unix variants by Sept. 1.

Why: To compete with Notes, Microsoft's BackOffice and Exchange, IBM's AS/400, and Novell's GroupWise

How much: $2,995 to $14,995, depending on DBMS version.

Powersoft appeases Mac users



By Frank Hayes

Powersoft Corp. has finally shipped the long-awaited version of its visual development environment for the Macintosh.

PowerBuilder for Macintosh hits the streets fully a year after the equivalent PC version, PowerBuilder for Enterprise 4.0. The version for the Apple Computer, Inc. platform was originally slated to ship last spring, but technology problems held up the release. Those problems have been solved, according to the Concord, Mass.-based subsidiary of Sybase, Inc.

Application development

At long last

Developers are just happy the Macintosh version is available.

"We've been anxiously awaiting the Mac version," said Roger Lurie, a principal application system analyst at Arizona State University in Tempe. Users are "quite angry" about the delays, he said.

But whether those users will be satisfied with the applications PowerBuilder for Macintosh generates remains a question. "It looks good from my perspective, but I'm not a Mac bigot," said a development manager at a West Coast media conglomerate. "I know how sensitive they are to ports from the Windows environment."

With the new release, users can move object libraries between the Windows, Macintosh and Unix versions of PowerBuilder without changing them. However, Macintosh developers must recompile a small portion of each PowerBuilder application that includes code to launch the program. The system also requires its own set of runtime libraries.

Any additional routines written in C++ or other languages called by the PowerBuilder application must be ported separately, which is "a medium-size pain," according to the development manager.

Like the PC version, the $3,295 PowerBuilder for Macintosh includes the Watcom SQL database and all standard PowerBuilder libraries. However, some additional libraries available for the Windows version aren't offered for the Macintosh version, such as one that provides access to Notes.

Powersoft said the delays that plagued this release won't affect the Macintosh version of PowerBuilder 5.0, which the company plans to ship soon after the PC version in midyear.

The delays came about when Powersoft decided to port its Windows-based development system to the Macintosh three years ago. The company turned to a third-party supplier, Altura Software, Inc. in Pacific Grove, Calif., for code libraries that would let developers use the same source code for the Macintosh and Windows versions.

But Microsoft Corp. announced it would include a similar feature in Visual C++, and Altura abandoned the product. Powersoft licensed the orphaned technology and spent much of the past year ironing out bugs in the source code, according to both Altura and Powersoft.

Microsoft shipped the cross-platform Macintosh version of Visual C++ in November 1994. Microsoft released a new version of the cross-platform system last month, and Powersoft said it will evaluate that version this year for future use.

OLAP gains fans among data-hungry firms

By Julia King

Delta Air Lines in Atlanta uses it to slice and dice frequent-flier marketing data by region, passenger market and customer segment.

Sega of America, the $1.5 billion electronic games company, uses it to mine gigabytes of retail data from hundreds of stores such as Toys R Us, Wal-Mart and Sears. Sega's goal is to quickly establish which marketing strategies work best at different chains by drilling down into data to unearth buying patterns that traditional accounting methods can't uncover.

The "it" in both these cases is on-line analytical processing technology, or OLAP — one of today's hottest but least understood technologies.

Simply put, OLAP lets users explore multidimensional views of data. It does this by pulling together information from several sources — including human resources, sales, marketing and inventory systems — and housing it in a separate, server-based database.

Using client-based OLAP tools, users can then query this combined data to generate sophisticated analyses.

A marketing manager, for example, could track quarterly sales by region, salesperson and customer. The manager could then go a step deeper with OLAP tools to analyze those figures in

OLAP, page 48

Windows 95 and OS/2: A contrast in style

Differences show up in interface and installation; performance a near draw

By Ted Vegvari and Brian Proffit

A hands-on evaluation of Microsoft's Windows 95 and IBM's OS/2 Warp that looks past the marketing hoopla indicates there isn't a clear winner for all users. The key to selecting the best platform isn't just understanding the user's specific needs, but determining the true capabilities and limitations of the products.

This review looks at the following areas with regard to how the two operating systems would perform for a typical corporate user running a midrange hardware platform:

- Installation. Windows 95 may prove easier to install and may recognize more devices, but OS/2 offers unique options.
- Performance. Tests show only minimal differences between the two operating systems — Windows 95 holds a slight edge in single-task tests; OS/2 takes the lead in multitasking.
- User interface. Windows 95 may be more appealing, but OS/2 may be more customizable.

Installation

From the start, Windows 95 presented us with a much more approachable face. The installation routine is well-designed, with appropriate visual cues and automatically displayed help text. Windows 95 was better at detecting and configuring the components in our Compaq Computer Corp. PC-based environment.

REVIEW

Windows 95 asks the user if it should search for a network card, sound card or CD-ROM drive. Warp detects those and loads the correct drivers automatically as long as the user has supported hardware. Warp didn't include device drivers for the onboard integrated SCSI-2 interface in our Compaq 486 test machines, so we had to download a device driver from IBM's Internet file transfer protocol (FTP) site. Then we had to manually modify one of the two installation diskettes so the CD-ROM with the rest of the Warp code could be loaded.

Likewise, we had to download a driver for Warp for our Compaq QVision 2000 video card.

Windows 95 insists on being installed in the C: partition of the hard disk, while Warp accepts other logical disks as well as C:.

Performance

The Compaq motherboards used in our tests contain buffered 16550-compatible serial communications support. The communications device drivers included with OS/2 ran somewhat slowly. Our tests showed a 4% to 12% decrease in OS/2 throughput vs. Win 95.

Compressed files transmitted the slowest and text files the fastest. We highly recommend that frequent modem users acquire the shareware SIO device drivers as a replacement from either the IBM Internet FTP site or the CompuServe IBM forum.

For equality, we used the device drivers and communications software included with each operating system. Windows 95 includes HyperTerminal, and OS/2 Warp includes HyperAccess Lite. Both are Hilgraeve Corp. products.

We tested system I/O while single-tasking and multitasking. We downloaded a 1.5M-byte file from CompuServe, first with nothing else running in the system and then with the download taking place in the background while we constantly typed and occasionally saved files in the foreground.

Typing was done using the editor included with each platform: WordPad for Windows 95 and the System Editor for OS/2 Warp.

The times shown in the chart on page 46 are the average of multiple runs conducted at different times of the day to allow for differing quality in the telephone connection.

With only the communication program running, Windows 95 had the edge, downloading 1.5M bytes of data slightly faster than OS/2 Warp. The times were reversed when multitasking, with Windows 95 slowing down while OS/2 Warp's throughput improved. This trend was most noticeable on machines with 12M bytes of RAM and less common on machines with 16M bytes or more of RAM.

We chose CompuServe and the Internet as the foundation for multitasking tests because in a business environment, establishing a network link is one of the two most common things people will want to do in a multitasking situation. Downloads were performed during the same time of day on three different days for each machine.

OS/2 performance caveats

OS/2 can run Windows applications windowed on the OS/2 desktop or in a full-screen Windows session. There is an overall noticeable performance differ-

Contrast in style, page 46

Reviewers find common ground

	User interface	Performance	Installation
Computerworld January 1996	"We found the Windows 95 interface to be much more visually appealing ... but OS/2's Workplace Shell ... was more customizable, although less intuitive in our tests."	"When running only one task at a time, Windows 95 was slightly faster than OS/2 Warp." "When multitasking, however, OS/2 was slightly faster than Windows 95."	"Windows 95 is better at detecting and configuring a greater number of popular components."
InfoWorld November 1995	"Windows 95's interface [rated good] is a huge improvement over Windows 3.x. It's easy to learn ... implementation of long file names borders on disastrous." "Warp's interface [rated good] offers tons of graphical objects but no help on how to use them."	"Windows 95 rated very good in serial applications, but good in multitasking. OS/2 rated good in serial applications, but very good in multitasking."	"Windows 95 [rated very good] provides more automatic installation options." "Upgrading from our existing Windows environment to OS/2 [rated good] was relatively painless."
PC Magazine September 1995	"[OS/2 Warp] looks a lot like Windows 95, but OS/2 Warp had it first."	"Windows 95 offers surprisingly impressive performance ... We recommend 8M bytes of RAM to achieve adequate performance." "Tested on an 8M-byte system, OS/2 Warp Connect didn't exactly shine ... On 16M-byte machines it was generally able to outperform Windows NT."	"A bad 32-bit application can still crash everything ... But in testing, we ran Windows 95 on a great number of systems with relatively few complaints." "OS/2 Warp proved the most challenging and unintuitive to install on our test hardware."

How we tested

Times (see chart, page 46) are averages of several runs of each test. Averages were compared with follow-up tests on a third clone machine.

Timed software tests were performed after a cold start to avoid cache optimized results. We didn't disable disk cache memory, which is critical to system performance.

No changes were made to factory-supplied hardware, and vendors made no recommendations to do so.

No special drivers or software were loaded beyond those made available from the IBM Internet FTP site and the Microsoft Internet browser, which can be downloaded from The Microsoft Network and Microsoft forums.

The goal was to perform comparisons on systems that reflect the midrange-level platform most commonly found in corporate sites. Therefore, testing was conducted on Compaq DeskPro XL Peripheral Component Interconnect (PCI)/Extended Industry Standard Architecture (EISA) systems, with 486DX2 processors running at 66 MHz.

The systems had a total of 16M bytes of main memory, plus 256K-byte secondary cache. The motherboard used a Compaq proprietary chip set, including embedded PCI Fast SCSI-2 and Compaq Enhanced Business Audio support.

In terms of storage, the systems had Connor Peripherals, Inc. 510M-byte SCSI disk drives and 2X SCSI CD-ROM drives. Compaq 171FS monitors were attached to Compaq QVision 2000 PCI graphics adapters with 2M bytes of video RAM. PC Lab added a 3Com Corp. Etherlink II ISA bus network card.

Vendors directly supplied all software.

Both Windows 95 and OS/2 Warp were allowed to establish default values for buffers, cache size and swap file size. Windows 95 was installed on a partition with its updated File Allocation Table file system, and OS/2 was installed on a partition with its High Performance File System.

Both operating systems were tested for crash recovery three times by removing power while the computer was writing to the hard drive. Both systems successfully restarted and recovered without user intervention.

The dBase 3.0 test involved the following: append 155,000 records; sort on two fields; replace string on match criteria; delete on match criteria; pack file; and index on two fields.

— Ted Vegvari and Brian Proffit

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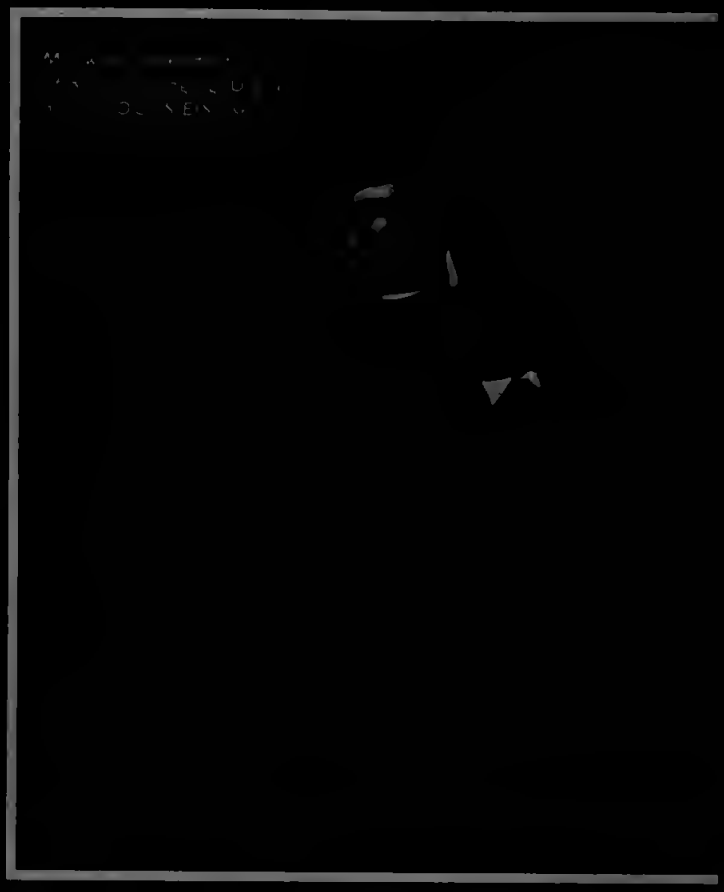

ESP It's an abbreviation for "Encouraging, Striving, Providing"... the company motto for Konica Imaging, U.S.A. It's also the name of Konica's new suite of killer apps for decision-support developed in just 10 weeks using FOCUS/EIS for Windows.

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Win 95 and OS/2: A contrast in style

CONTINUED FROM PAGE 44

ence between the two modes not exclusive to the communications performance tests. The full screen sessions run more quickly.

Also, Win 95 doesn't give you the option to run some Windows applications in Standard Mode rather than Enhanced Mode, but OS/2 does, which can also improve performance.

While these merit mentioning for those who manage computer resources, most users in the corporate environment probably won't have the time or inclination to learn about all the optimization techniques for Windows or OS/2.

User interface

In our view, as companies go, so go their products. IBM is reliable, if stodgy. Microsoft is flamboyant, if unpredictable. So, too, are their user interfaces. Those upgrading to either of these platforms from Windows 3.x will find significant changes.

Both interfaces exploit the right mouse button to allow you to change the properties of the objects on your desktop. We found the Windows 95 interface to be much more visually appealing because of the graphic design and styles of images.

However OS/2's Workplace Shell, through the Templates folder and the Scheme Palette, was more customizable, although less intuitive in our tests. OS/2 allows you to use different background bitmaps and color schemes for each folder. You have total control over all aspects of your desktop appearance with the Workplace Shell.

Both interfaces offer a new method for accessing your most-used programs. OS/2 provides the LaunchPad, a window with icons for the most popular programs and drawers that can be opened and closed from the LaunchPad.

That's a step in the right direction, but we believe the single-click hierarchical structure of the Windows 95 Task Bar is even easier for those who think in terms of the programs they want to run.

Innovative touches — the highlight in a menu moves as the mouse pointer moves, and second-level menus automatically open when the pointer moves over them — combine to make interaction with Windows 95 more intuitive than OS/2.

On the other hand, the Workplace Shell encourages the user to focus on data, not on programs. It does this not just through associations — allowing the user to load the appropriate program just by clicking on the data file to be processed — but also through the new concept of work areas.

If the user defines a folder as a work area, each of the files is treated as part of the group. A user can open all the files and, therefore, all the associated programs, in a particular project.

TCP/IP under OS/2

TCP/IP can be installed as a separate service. Or, if you later install the Internet Access Kit, which includes a browser and other tools, TCP/IP is transparently installed at the same time.

After installing the Internet connection, Web Explorer allows the user to choose to connect to IBM Internet or to an alternate service provider. If the user selects IBM Internet, configuration information is provided. If the user selects an alternate provider, TCP/IP configuration will be necessary.

TCP/IP under Win 95

Adding TCP/IP was mostly a straightforward process, keeping in mind that we are familiar with it. After typing in our IP number and subnet mask and clicking ou OK, Win 95 displayed a message stating that Workgroup information had to be typed in (workgroup name was required).

At this point, some users will become confused and may cancel adding TCP/IP. Workgroup information isn't necessary to connect to Internet services.

Vegvari is principal for Computer People Resources, PC Lab, a consulting, development and information technology testing firm in Torrance, Calif. (http://www.pclab.com). Proffitt is a senior contributing editor and researcher to PC Lab and senior contributing editor to *OS/2* magazine.

OS/2's chance for success may be on the server, Charles Babcock says. See page 100.

Microsoft plans to keep improving Windows 95

This quarter, Microsoft plans to roll out a set of incremental improvements it has made to Windows 95 since releasing the system into what it calls a Service Pack.

Microsoft plans to release the product in late January or early February, a Microsoft spokesman said.

Service Packs will be issued periodically and will include device drivers, functions and components that weren't available with Windows 95, as well as some bug fixes.

Most, if not all, of these additions are already available for users to download from Microsoft's FTP server on the Internet.

The Service Pack won't be incorporated into the shrink-wrapped version of Windows 95 until the next major update, said Russ Stockdale, group product manager in Microsoft's Personal Systems Division.

The company won't officially talk about the next major commercial release, which is code-named Nashville, but sources said it may ship in late 1996 or in 1997 (CW, Dec. 18).

The Service Pack will be available to corporate customers, but Microsoft has no immediate plans to incorporate it into its commercial shrink-wrapped product. Pricing and media formats haven't been decided yet, according to Microsoft.

The following components will be included in the Service Pack:

- Support for Novell, Inc.'s NetWare Directory Services (NDS).
- 32-bit Data Link Control protocol software to let users of 32- and 16-bit applications access IBM mainframes and AS/400s.
- A device driver to let Windows 95 work with infrared-enabled devices.
- An update to the Windows 95 user interface to give users the ability to browse NDS printers from the Add Printer wizard.
- Drivers to fix problems in Windows 95 file- and printer-sharing security.
- Updated OLE files that fix problems discovered in Windows 95 versions of Word, Excel and Powerpoint.
- Updated drivers for a wide variety of devices from various manufacturers.

— Stuart J. Johnston

Big product plans from Big Blue

IBM is restating its commitment to OS/2 and plans to beef up its family of OS/2 offerings throughout 1996.

This month IBM is slated to ship the long-awaited PowerPC version of OS/2. Originally due out last June, OS/2 for the PowerPC has the same look and functionality as the current OS/2 Warp Connect but will be the first OS/2 product to be based on the IBM Microkernel.

This release of a RISC version of OS/2 is expected to help boost sales of IBM's line of PowerPC desktops and laptops, which debuted last June. Currently, users of IBM's PowerPC systems can run only AIX or Windows NT.

In the first quarter of the year, IBM plans to deliver its OS/2 Warp Server product, which melds the features of OS/2 Warp Connect and IBM's LAN Server 4.0 operating system. OS/2 Warp Server is considered a key piece of IBM's arsenal in the company's fight against NT.

By midyear, IBM expects to deliver Merlin, an updated version of OS/2 Warp Connect. The new version of OS/2 for Intel Corp. platforms will feature a glitzier and more customizable interface, beefed-up Internet access, more drag-and-drop features and a utility that streamlines the installation process.

— Lisa Pinsville

Close shave

Performance differences between Windows 95 and OS/2 are fairly slight. Win 95 gains an edge in single tasks, and OS/2 inches ahead in multitasking.

Test	Time to complete the task: OS/2	Windows 95
Launch Describe word processor	6.04 seconds	6.08 seconds
Install PerfectOffice for Windows 95 and OS/2 utilities	25 minutes, 43 seconds	19 minutes, 56 seconds
Launch WordPerfect	17.79 seconds	11.08 seconds
Launch Quattro Pro	9.55 seconds	10.64 seconds
Run dBase 3.0 for DOS	45 minutes, 26 seconds	37 minutes, 18 seconds
Install Notes 3.3 client software	8 minutes, 15 seconds	5 minutes, 58 seconds
Reindex an 11.5M-byte Notes file while running dBase script	14 minutes, 34 seconds	15 minutes, 26 seconds
Download 1.5M-byte file from CompuServe	9.26 seconds	3.09 seconds
Download 1.5M-byte file from CompuServe while running dBase script	10 minutes, 4 seconds	10 minutes, 16 seconds
Launch WordPerfect while running dBase script	7 seconds	6.05 seconds
Start dBase script and download 2.6M-byte file from the Internet	20 minutes, 23 seconds	19 minutes, 49 seconds

Source: PC Lab, Torrance, Calif.

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Informix merger yields data handling capabilities

By Dan Richman

As a result of Informix Software, Inc.'s Dec. 21 deal to buy Illustra Information Technologies, Inc., users will gain the ability to manipulate and store nontraditional data.

Falling into the nontraditional category are video, image and seven other kinds of noncharacter, nonnumeric data. Users will be able to eventually store and manage it from within Informix's relational database management system.

Currently, Informix can store nontraditional data, but not in a format that allows it to be manipulated or queried. Illustra's relational engine can already index, sort and query nontraditional data, but it lacks the scalability and power of Informix.

A kit to allow Informix applications to handle nontraditional data is due by the end of the year, both companies said. The merged Illustra/Informix database engine will follow. Further product details will be announced on Feb. 6.

"This is certainly an imaginative move by Informix, though whether any real integration of these two companies can be achieved within a year is doubtful," said Sanjeev Varma, research director for industry analysts at Gartner Group, Inc. in Santa Clara, Calif. Varma said that between Informix's relationship with Netscape Communications Corp. and Illustra's relationship with America Online, Inc., the combined company "will be in good shape to compete for the Internet market."

Users cheer

Users reacted favorably to the $350 million stock swap. "Being able to handle a lot of different data types in a real business environment would be great," said Willie Wong, an Informix user and president of Horizon Technology, a consultancy in Rowland Heights, Calif.

"Anything that would help assemble and manipulate Web pages that access our database would be welcome, because even though it's popular to talk about, it's beyond the average person's ability to do," said Walt Hultgren, manager of information technology for a research center at Atlanta's Emory University.

Informix and Illustra claim the buy gives them a technology lead of 18 months in manipulating nontraditional data. But Version 7.3 of Oracle Corp.'s Oracle7 RDBMS, which is now shipping, already handles spatial and video data, and the WebServer Option, also available, makes Oracle data available on the World Wide Web, Oracle executives said.

Dealing with nontraditional data

The Illustra Server lets users store, retrieve and manipulate data other than traditional numbers or characters using modules called DataBlades. Prices are for single-user licenses except as noted.

Text	Full text search	$795
Video	Multiple video streams	$395
Web	Supports HTML as data type; allows queries to be embedded in HTML pages	$395
Visual Information Retrieval	Allows content search of images.	$1,195
Gateways to Oracle and Sybase	Accesses or integrates data in those RDBMSs	$1,995 per Illustra Server

OLAP

CONTINUED FROM PAGE 43

terms of other business events, such as retail promotions and discount programs.

"OLAP technology does one really simple thing: It puts a piece of technology on the desktop that finally acts the way people think, in terms of four or five different things at once," said Karen Rubenstrunk, director of application development strategies at Meta Group, Inc. in Stamford, Conn.

But on the other hand, OLAP increases system complexity by requiring a separate repository — or multidimensional OLAP database — where financial, sales and other data can be funneled and stored. Users equipped with front-end OLAP tools then access and manipulate that data.

OLAP also requires server and client software. A 25-user system costs anywhere from $30,000 to $80,000, according to Rick Crandall, chairman of Comshare, Inc. in Ann Arbor, Mich., and spokesman for the OLAP Council, a nine-member consortium of OLAP software vendors.

"The real business benefit of installing OLAP software is that you have a better way to slice and dice data and to view and query data with speed," said Michael Joseph, an analyst at International Data Corp. in Framingham, Mass.

On the downside, duplicate databases mean increased data complexity, which can create data management problems, Rubenstrunk said. And funneling data to a second OLAP database means increased network traffic.

Still, users say the benefits can far outweigh the costs. At Sega, for example, managers can analyze the impact of various advertising programs and then more effectively target their $40 million advertising budget, said Steve Koch, the company's director of marketing research.

OLAP software vendors fall into one of three categories. In the first group are providers of OLAP database engines, such as Arbor Software Corp. in Sunnyvale, Calif. The second group contains front-end OLAP tools providers, such as Ottawa-based Cognos, Inc. In the third category are companies that provide both, such as Comshare.

Increasingly, client/server applications vendors are jumping into the relatively small, $176 million OLAP business. In 1995, Oracle Corp. purchased OLAP software vendor IRI Software, Inc.

Last November, Hyperion Software Corp. announced that this spring, it would add an OLAP application to its enterprise suite of financial accounting software.

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Oracle

CONTINUED FROM PAGE 43

dors Novell, Inc. in Provo, Utah, with its GroupWise; Lotus Development Corp. in Cambridge, Mass., with Notes; and Microsoft Corp. in Redmond, Wash., with Exchange. "I can see InterOffice being popular with the 500,000 users of its current, character-based office suite, but it has a job ahead of it to bring new users into the fold," Levitt said.

InterOffice Suite will let users send and receive faxes, electronic mail and voice mail, Oracle CEO Larry Ellison said at the product's launch. The suite will support discussion groups and calendaring, and it will manage documents through the ConText server-based search engine.

Like all groupware products, InterOffice Suite will be compared with Notes. Analysts say that if Oracle delivers it on time, InterOffice will pass that test because its architecture is superior to that of Notes and its competitors. Those include Microsoft Corp.'s BackOffice and to a lesser extent, IBM's AS/400, which in headquarters/remote site installations is popularly used for groupware-type communications.

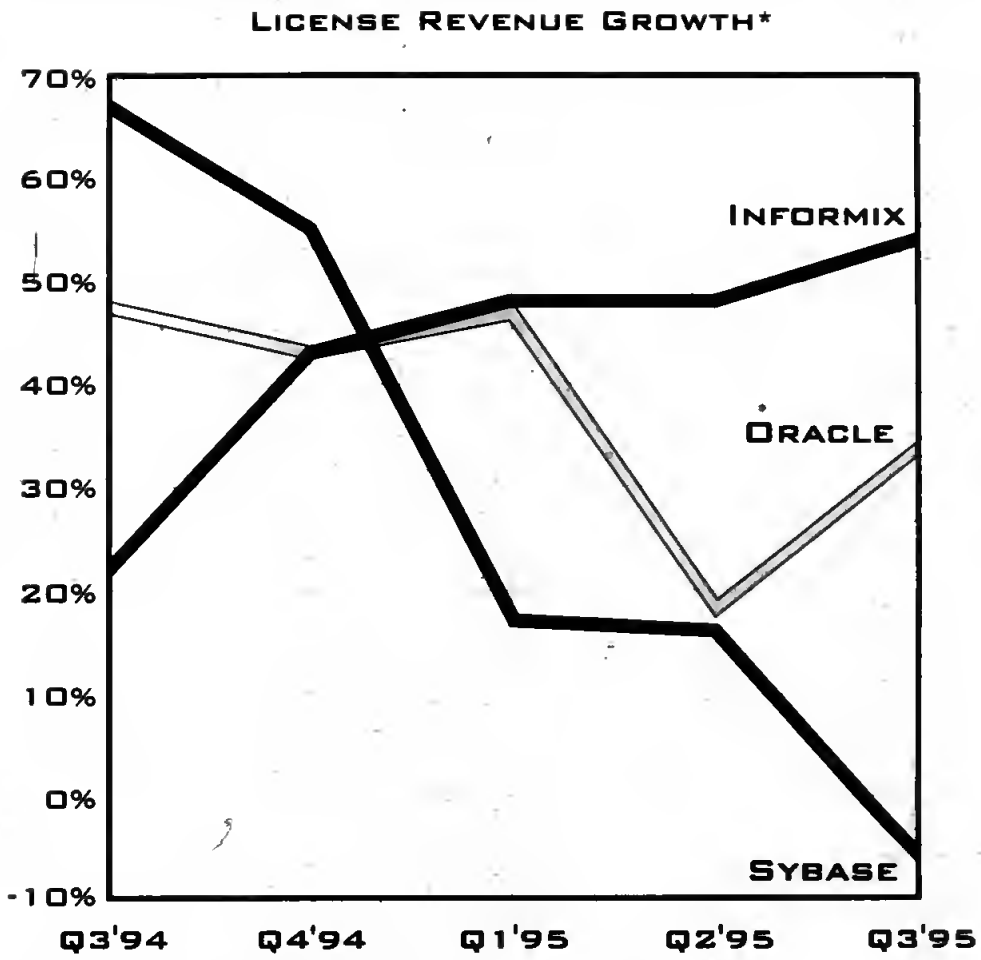
BackOffice lacks the sophisticated centralized management that InterOffice promises, and the AS/400 requires dumb terminals, depriving users of their PCs.

"Oracle has made its architecture Internet-aware," said Tim Sloane, an analyst at Aberdeen Group, Inc. in Boston. "Any desktop, any browser can have access to it."

In essence, Redwood Shores, Calif.-based Oracle has said it will give users access to data no matter what they have on the desktop, Sloane said. "Lotus would love to say that; architecturally, they can't say that," he said.

But some analysts are skeptical.

"I'm convinced they have the right idea here, but with all this Web emphasis, Oracle is entering into a world it doesn't know well, which concerns me," said Dan Kusnetzky, a research director at IDC.



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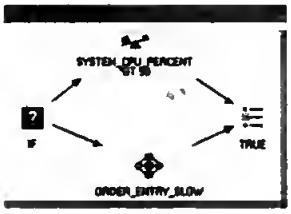

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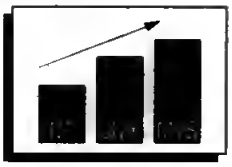

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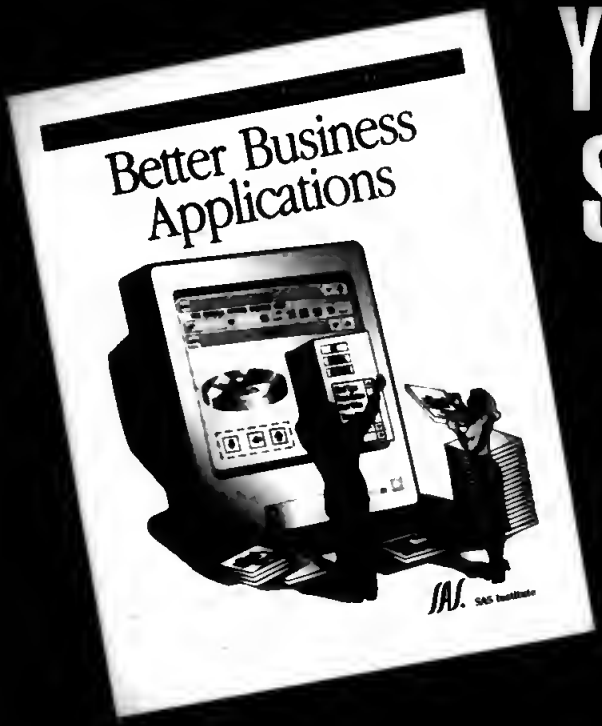

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USERS 'WAIT AND SEE' ON RADIOMAIL'S EXPANDED SERVICES, 55
NEW PRODUCTS, 56

Managing client/server gets easier

By Patrick Dryden

This year, the daily grind of managing far-flung client/server networks should get a little easier.

Harried managers will see more opportunities to monitor networks and systems from Windows NT rather than Unix. And they'll be able to spread status and performance reports via the World Wide Web.

That is cheery news for administrators who must wrestle with increasingly complex, constantly changing technologies while coping with decreasing staff, budgets and time.

But they want such help sooner, not later. By midyear, such products shouldn't be a novelty.

"The technology and products continue to evolve at a glacial pace toward easy-to-use, effective management capability," said Rick Sturm, a member of the technical staff for management at US West Communications, Inc. in Denver.

Texas Department of Human Services' David Freeland *said his goal is to open up more central status and performance data to support staff in the field*

Management products still require too much effort — training staff, customizing tools and performing functions — before they fit into a particular company's environment, Sturm said. "The situation won't get markedly easier right away," he said.

One step in the right direction, users said, is a step away from Unix, which many tools for managing elements such as routers and hubs have required.

"It's not a technology case but a business case: We don't have time to devote to management in today's environment," said Rick Sangha, telecommunications manager at specialty steel producer Allegheny Ludlum Corp. in Pittsburgh.

He junked a Unix-based router manager and network platform in favor of similar software that runs on Windows NT. "You must be aware of the administrative overhead from working with Unix and whatever managers and database live on top of it," he explained. "That whole environment requires too much housekeeping and rocket scientists to run it."

Digital Equipment Corp. already has shipped a Windows NT version of Polycenter Manager on NetView, which is an enterprise-capable network management platform. Cabletron Systems, Inc. should complete beta testing early this year of Spectrum 4.0, a distributed platform that runs on Unix servers and now on Windows NT. Hewlett-Packard Co. and IBM have promised similar support, but haven't offered any specifics yet.

Familiar Windows interaction with management tools may empower a broader class of administrators, but some users see even more potential through applying Web technology.

"My users need basic information about network status, but the vendors failed to deliver information how I want it," said an information systems engineer for a telecommunications provider. He wrote scripts to gather such data from IBM's NetView for AIX and send it to a Web server. "Now I have a browser interface so anyone, anywhere, can get current management statistics," he said.

Web options

Cabletron will provide direct Web reporting in the upcoming Spectrum release, and Digital has prototyped a tool called WebView. Some users prefer to wait for such vendor options.

"We could adapt Web reporting ourselves, but we don't want to get bogged down creating nice graphics and providing maintenance," said David Freeland, telecommunications director at the Texas Department of Human Services in Austin.

Freeland's goal is to open up more central status and performance data to support staff in the field. "They already have browsers, so we wouldn't need new software," he explained. "This would be simple to deliver and easier to read than our current tools."

Dave Calcano/IDG

Users face hurdles on road to ISDN

By Bob Wallace

ISDN turns 12 this year, and observers say it's every bit as mature as its fellow sixth-graders.

Though hyped as a prime-time data service since its launch in 1984, Integrated Services Digital Network (ISDN) has a lot of growing up to do. Information systems managers still must address fundamental issues when evaluating the service.

First and foremost is service availability. ISDN Basic Rate Interface (BRI) is a local service that the seven regional Bell operating companies (RBOC) offer on a widely varying scale.

Data services

Pacific Bell and Bell Atlantic Corp. offer the service widely, though not ubiquitously, while others, such as Nynex Corp., offer BRI only in geographic pockets.

Another key issue is BRI's distance limitation. Typically, the service is offered only within 3½ miles of the closest switching center.

"This is a problem, especially given that ISDN is being pushed as the service for telecommuters," said Mike Finneran, president of dBrn Associates, Inc. in Hewlett Neck, N.Y., a firm that specializes in ISDN consulting and education. "But if the telecommuters live outside that circle, they're on their own."

Companies looking to leverage ISDN may have to require that telecommuters travel to a telecommuting center equipped with ISDN lines. The alternative is much slower, but relatively pain-free, 28.8K bit/sec. modems and dial-up links.

Despite the hurdles, Domino's Pizza, Inc. is weighing ISDN against frame relay at 700 of its stores.

"Hurdles for ISDN? Nah," quipped Dan Gonos, telecommunications manager at the Ann Arbor, Mich.-based pizza chain.

"Seriously though, [ISDN] is in the mix because it offers medium-sized bandwidth and is relatively inexpensive. And one major benefit is that ISDN is more widely deployed than frame relay where we need it," Gonos said.

Still, potential ISDN users must deal with a lack of uniformity in service ordering, provisioning, installation, billing and support.

"If all your locations are in one RBOC region, you're OK because you only have to deal with one ser-

ISDN, *page 57*

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Source: Survey of COMPUTERWORLD CD subscribers, May 1993.

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Some users deploy NDS beyond basic capabilities

By Laura DiDio

A recent report says most users implement only the basics in Novell's NetWare Directory Services (NDS). But don't try telling that to Gary Kajutis or Brad Errington.

Kajutis and Errington are just two NetWare 4.x users who say they are deploying Novell, Inc.'s NDS as more than just a "super bindery" to facilitate single log-ins for large enterprises.

In NetWare 2.x and 3.x, the bindery was the system database portion of the core network operating system. Data contained in the bindery is accessible only to applications that use NetWare application programming interfaces.

NetWare 4.x's NDS lets users replicate information about the entire enterprise.

But Kajutis' and Errington's experiences directly contradict a recent report by The Burton Group, a consultancy in Salt Lake City. The report claimed that "it's still hard to find major customers who are using NDS for anything beyond its most elementary purposes."

The Burton Group report also claimed that a steep learning curve and administrative difficulties carried over from the older NetWare 3.x binderies are inhibiting users from fully adopting NDS.

To the contrary

But that hasn't been the experience of Errington, a corporate LAN/WAN manager at General Nutrition Companies, Inc. (GNC) in Pittsburgh. He said GNC uses NDS for basic and advanced capabilities, all of which have benefited his organization.

"Using NDS's basic capabilities isn't bad," Errington said. "Managing large numbers of user accounts might be elementary, but it's also the biggest time-saver I've seen, and time is money."

GNC has used NDS to consolidate its user accounts on a single server. This simplifies management and tracking, helps to synchronize password accounts and cuts down on replication.

"That may sound simple, but in actuality, it saves a lot of headaches, since users are famous for having multiple passwords, forgetting them and calling me for help," Errington said.

NetWare Directory Services

Meanwhile, Kajutis, MIS coordinator at Teck Corona Operating Corp., a mining company in Ontario, said, "I've gone way beyond using NDS as just a bindery replacement. We use it to set up multiple NDS database 'containers' to group functional areas such as the engineering, accounting [and] maintenance departments." Kajutis said this container structure makes it simple to build flexible, speedy log-in scripts.

Kajutis acknowledged that NDS was a big switch from the previous NetWare 3.x binderies and that he needed to get additional training.

To smooth the NDS upgrade migration, Kajutis bought a set of seven instructional videotapes from Keystone Learning Systems, Inc. and "watched all 14 hours."

The tapes helped Kajutis decipher an advanced NDS feature called Directory Map Object, which allows him to easily set up, consolidate and move various desktop applications and directories with a simple click. This is all done transparently to Tech Corona's user base.

"It's great because I no longer have to maintain separate batch files and log-in scripts for my NetWare 3.x and 4.x user base," Kajutis said.

It was user reaction such as this that prompted Dave Capuccio, an analyst at Gartner Group, Inc., a Stamford, Conn., consultancy, to advise users to migrate as quickly as possible from NetWare 3.x to NetWare 4.x, specifically for the advanced enterprise management features of NDS.

"NDS can save users more than $900,000 over three years for those running 30 servers or more," Capuccio said. "Delivering full NDS functionality for Microsoft's Windows NT Server platform is especially crucial, since so many businesses — up to 90% of NetWare sites — are installing NT Server alongside NetWare."

Keep upgrades coming

The users also agreed that Novell must continue to deliver regular enhancements to NDS. Tops on their list is further integration between NDS and common network-based applications such as Notes and Microsoft's SQL Server.

Michael Simpson, Novell's product line manager for NetWare, said users can expect Novell to roll out some of that functionality this year.

"We have currently 140 NDS-aware applications shipping, including Oracle's Workgroup Server and Enterprise Server. Sybase and Btrieve are also NDS partners, and they will be releasing NDS-enabled databases within the next several months," he said.

Users 'wait and see' on RadioMail's new package

By Mindy Blodgett

Manley Bland, a hard-core user of RadioMail Corp.'s wireless messaging service, is taking a wait-and-see attitude toward the company's decision to include cellular and CDPD networks in its coverage.

- Access via analog cellular or Cellular Digital Packet Data
- RAM Mobile Data or ARDIS wireless access
- Dial-up access via wired connection
- RadioMailBox will hold long messages and then forward until link can be established

RadioMail currently is available only on the RAM Mobile Data and ARDIS Co. packet radio networks, rivals to Cellular Digital Packet Data, or CDPD.

Multiple uses

Bland uses RadioMail to track real estate services and access the Multiple Listing Service via messaging and faxing.

"I've seen the CDPD systems demonstrated, and I am not impressed," said Bland, vice president of Spatial Data, a division of Datatrack Systems, Inc. in Carlsbad, Calif. "I don't think the connections are that good with cellular or with CDPD."

But Bland acknowledged he would be happier with wider access. He said if the new, expanded RadioMail package accomplishes that, he would be willing to try it.

RadioMail, in San Mateo, Calif., announced in November that it would broaden its availability to encompass cellular, CDPD and dial-up access.

The company also announced it would expand its message-management capabilities, giving mobile customers a universal electronic-mail gateway and the ability to remotely sort through messages.

This service, to be called RadioMail Remote Control, will be available in the first quarter at a cost of $9.95 a month for cellular subscribers and connection charges of 20 cents a minute. The system will allow users to connect to a RadioMailBox over cellular links and send their messages to a fax machine or enterprise E-mail system.

Trying to stay afloat

Analysts said RadioMail needs to do something to stay alive.

"RadioMail is struggling. It must diversify its platforms," said William Frezza, president of Wireless Computing Associates in Yardley, Pa. "That is what this recent cellular and CDPD initiative is about."

Roberta Wiggins, an analyst at The Yankee Group in Boston, said, "This obviously expands their opportunities, which can only help."

Analysts said it wasn't clear whether RadioMail's move will attract more users to the service.

Other companies offering services similar to RadioMail's are Data Transmission Services, Inc. in Woodbridge, N.J., with its ZapIt service, and WyndMail Corp. in San Luis Obispo, Calif., with its Wynd Mail.

Briefs

3Com boosts hub

3Com Corp. in Santa Clara, Calif., will soon announce a 155M bit/sec. Asynchronous Transfer Mode (ATM) uplink for its CELLplex 7000 ATM switching hub. The uplink will cost about $1,000 and enable the hub to be tied to an ATM backbone network using unshielded twisted-pair wire.

Surfing modems

Motorola Information Systems Group's Transmission Products Division in Huntsville, Ala., has rolled out the low-cost Surfr Series modems, low-end modems equipped to let users easily access the Internet. The new line includes the OnlineSurfr, a 28.8K bit/sec. data/fax modem that comes with CompuServe, Inc.'s WinCIM software, a home page development kit, Spry, Inc.'s Mosaic Web browser, electronic-mail software and file transfer software for $[illegible]. The vendor also offers VoiceSurfr, a V.32 bis data/fax modem for $159 that enables simultaneous voice and data transmission over a single telephone line.

Firms link tools

Platinum Technology, Inc. in Oakbrook Terrace, Ill., recently integrated chargeback functions for its client/server systems management tools and announced plans to support Spectrum, the distributed enterprise network management platform from Cabletron Systems, Inc. Several Platinum tools are being considered for integration with Spectrum. These include help desk, software distribution, job scheduling and database management packages.

Platinum buys RMS

Separately, Platinum last month acquired RMS Computer, Inc. in Newcastle, Calif. The move added the Computer Installation Management System (CIMS), a suite of applications for information systems cost recovery in mixed-network environments. The multiplatform CIMS collects and processes usage data from diverse operating systems to charge user accounts. Applications include job accounting, cost analysis, chargeback and resource utilization reporting. Prices vary according to configuration.

AMP, Inc. has announced a line of wireless Ethernet LAN products, including LAN Access Point, a PCMCIA adapter and an Industry Standard Architecture (ISA) card adapter.

According to the Harrisburg, Pa., company, the wireless products give users network connectivity throughout offices and among buildings. LAN Access Point operates at distances of up to 500 feet in regular office locations and up to 1,000 feet in open space environments. Each Access Point uses a multichannel approach, which lets up to 15 independent LANs operate within the same space.

The PCMCIA adapter was designed to give users convenient mobile communication while consuming 10% to 15% of typical portable computer battery line power. The ISA adapter was designed to extend wired LANs in desktop locations that are difficult or expensive to cable.

LAN Access Point costs $2,145. The PCMCIA adapter costs $695, and the ISA adapter costs $595.

▶ *AMP*
(717) 564-0100

Anglo Communications, Inc. has introduced SafeSend, a dedicated telephone line adapter.

According to the Provo, Utah, company, SafeSend lets PC card fax/modems communicate over digital private branch exchange (PBX) telephones and eliminates the need for dedicated analog phone lines in home offices. It installs to a telephone handset jack and doesn't require an additional power source to adapt the voltage for transmission over digital lines.

A manual switch on the adapter lets users select the correct impedance match necessary for PBX telephone systems.

SafeSend costs $129.

▶ *Anglo Communications*
(801) 371-0488

Procom Technology, Inc. has introduced CDForce, a server product line.

According to the Irvine, Calif., company, CDForce lets network administrators add CD-ROMs to their networks, which eliminates the need to install software and configure it with server hardware. CDForce attaches to and communicates with any major network and lets networked groups in an organization share the same stored data. The server connects directly to any network and allows access from any client workstation through most operating systems and communication protocols. Clients can reach a CDForce server through TCP/IP, Ethernet, Token Ring, Fiber Distributed Data Interface, Fast Ethernet and Asynchronous Transfer Mode.

Multiple CD-ROMs can be mounted under a single volume or drive letter, a design for eliminating the mounting and dismounting of individual drives.

CDForce is available in 14-, 21- and 56-drive CD servers in a tower arrangement, providing up to 36G bytes of storage capacity. The servers can be equipped with quad- or six-speed drives.

Pricing for CDForce starts at $16,995.

▶ *Procom Technology*
(714) 852-1000

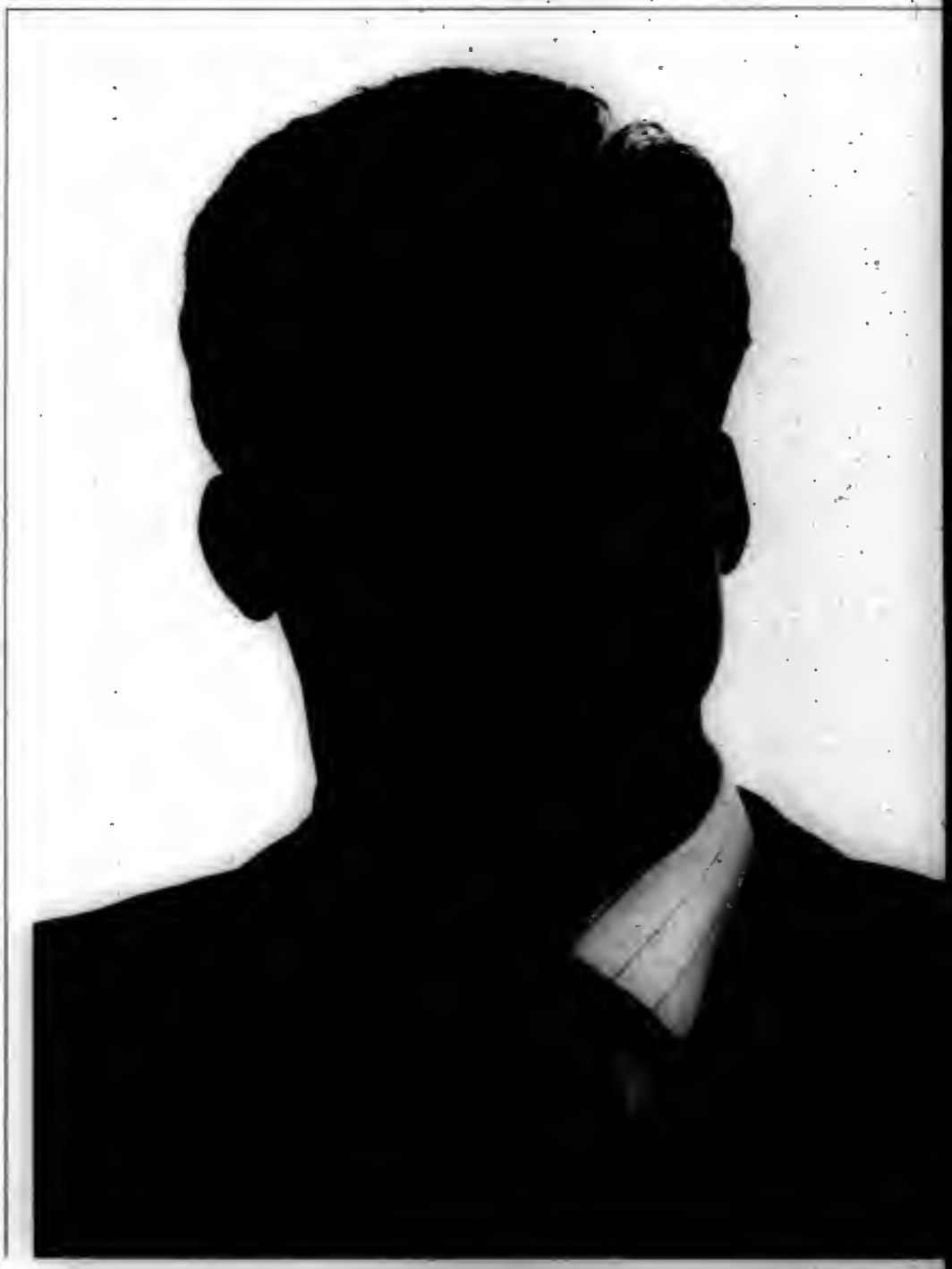
Artisoft, Inc. has announced NodeRunner Pro UTP Ethernet adapter and Node Runner Pro Combo Ethernet adapter.

According to the Tucson, Ariz., company, both adapters use one-third the power of other Ethernet adapters while providing increased network throughput by using concurrent processing. They have 32K-byte buffer RAM for reducing overhead on networks with high traffic and multitasking operating systems. They also include Desktop Management Interface (DMI) support for managing network PCs with DMI-compliant applications.

NodeRunner Pro UTP Ethernet adapter supports 10Base-T (unshielded twisted-pair) cabling. NodeRunner Pro Combo Ethernet adapter supports 10Base-T and 10Base-2 (thin coaxial) cabling. They are compatible with network environments, including Novell, Inc.'s NetWare, Windows 95 and Artisoft's LANtastic network operating system.

Pricing for NodeRunner Pro UTP Ethernet adapter starts at $99. Pricing for NodeRunner Pro Combo Ethernet adapter starts at $109.

▶ *Artisoft*
(520) 670-7100



Citadel Computer Systems, Inc. has unveiled NetOff System™ IV 4.54 for Novell, Inc. NetWare networks.

According to the Houston company, NetOff System IV 4.54 automatically logs off unattended networked PCs to prevent unauthorized access to files, keeps server connections open for users and prevents open files from interfering with backups.

NetOff System IV 4.54 has three tools to secure a NetWare network: a password-protected screen blanker, inactivity log-off and clock-time log-out. The screen blanker locks a PC so it can't be used without a password.

The inactivity log-off acts after the keyboard and mouse are idle for a given period.

The clock-time log-out closes and saves files and logs users off for backup purposes.

Pricing for NetOff System IV 4.54 starts at $499 for one server and up to 100 workstations.

▶ *Citadel Computer Systems*
(713) 686-6400

McAfee Associates, Inc. has introduced ServerStor 2.0, a network storage management product.

According to the Santa Clara, Calif., company, ServerStor 2.0 provides comprehensive departmental server backup, high availability and hierarchical storage management to protect the integrity and availability of networked data for Novell, Inc. NetWare 3.x and 4.x servers.

ServerStor 2.0 integrates tools to automate data protection and recovery. It features a graphical interface, automatic creation and scheduling of jobs and a librarian to locate and restore lost data.

Pricing for a two-year subscription starts at $7.50 per node for 1,000 nodes.

▶ *McAfee Associates*
(408) 988-3832

SQA, Inc. has introduced SQA LoadTest 4.0, a client/server network application testing tool.

According to the Woburn, Mass., company, SQA LoadTest 4.0 lets users test enterprise Windows client/server applications under different load, stress and multiuser scenarios.

It features an integrated graphing and analysis tool based on a performance-metrics database and an incremental loading facility that adds stations in specified increments during test runs.

SQA LoadTest 4.0 was designed to test applications under different client machines and response times, network stress levels and how the applications work on different machines.

Pricing for SQA LoadTest 4.0 starts at $10,000.

▶ *SQA*
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ISDN

CONTINUED FROM PAGE 53

vice provider," said Maralyn Rosenblatt, a former network manager at Lockheed Corp. She now heads MIR Enterprises, a consultancy in Canoga Park, Calif.

"But if they're not, you have to deal with multiple RBOCs, all of which use different processes for delivering ISDN," she said.

The differences carry over into pricing. Some RBOC pricing schemes are simple, but others, such as Ameritech Corp.'s, resemble a Chinese menu, Rosenblatt said. Some charge users onetime setup fees of more than $100 per line.

Monthly fees

Usage charges can be another gotcha.

Finneran said Pacific Bell charges $26 a month for a BRI line, and that is the lowest of the seven RBOCs. But it also charges for usage, which means an additional $4.30 to $18 an hour. BellSouth charges the highest fee, $87.50 a month, but that includes all usage.

IS managers also will need to shell out money for an ISDN terminal adapter, which typically costs about $350.

Though getting ISDN may seem like a logistical nightmare, there are a few companies, including Intellicom, Inc. and Primary Rate, that provide one-stop shopping for ISDN. Other vendors, such as US Robotics, Inc., have collected ordering, provisioning, installation and pricing information for the RBOCs and provide this valuable information to prospective ISDN users.

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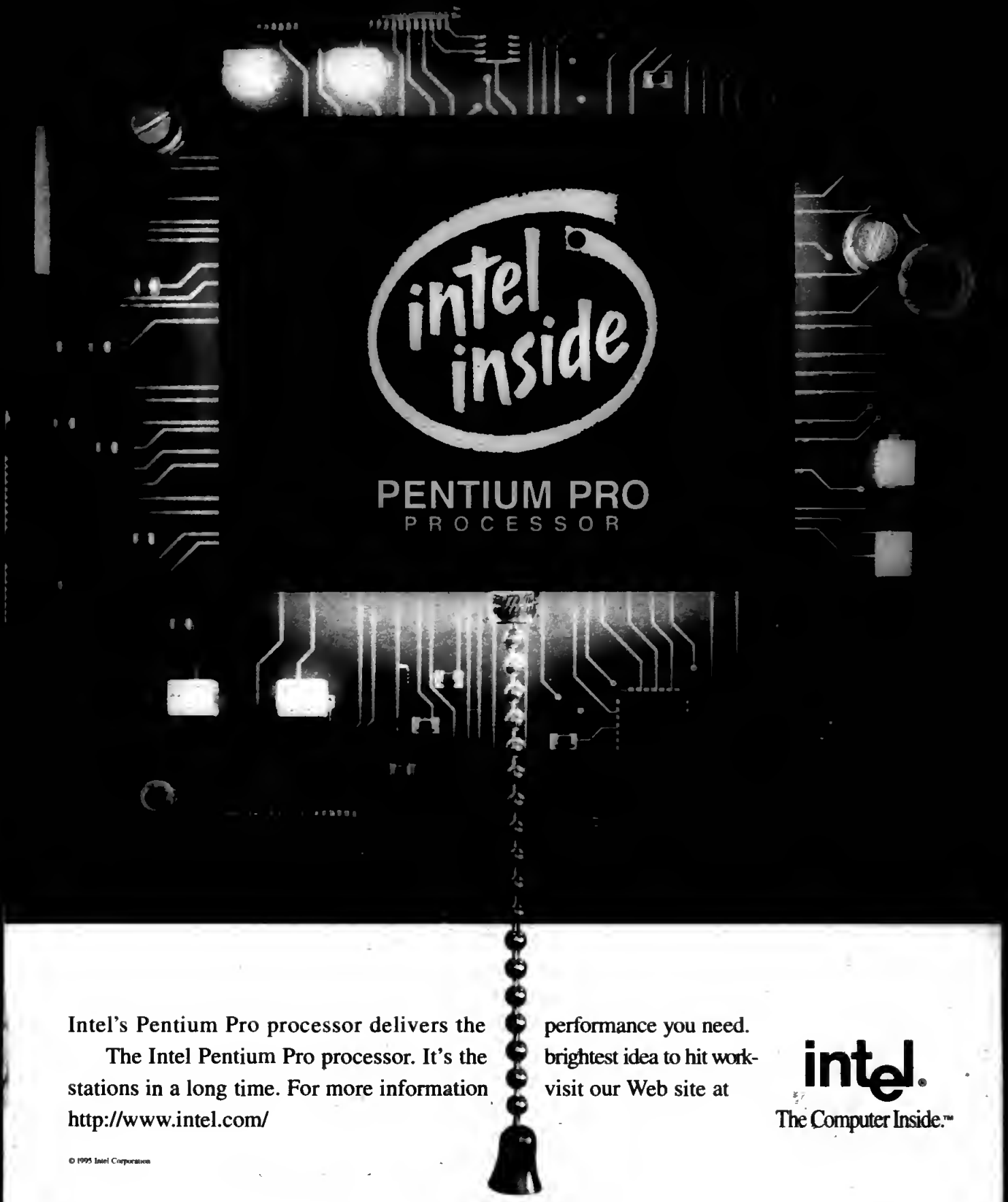

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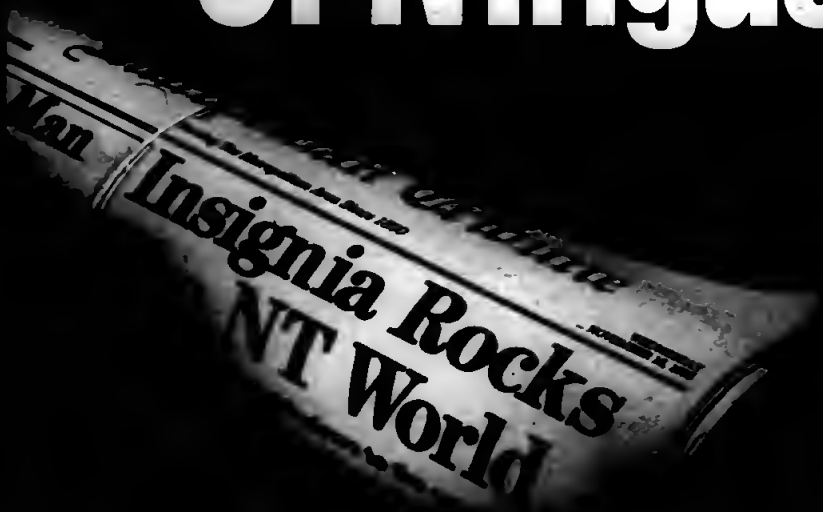

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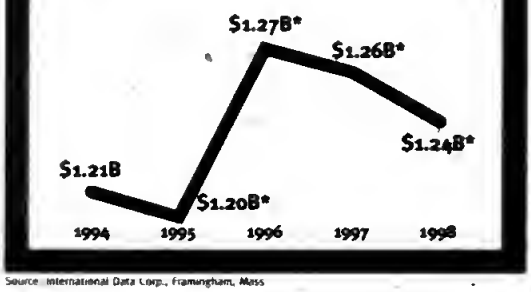
Snapshot

Like client PCs, LAN operating systems are feeling the pressure of price wars, causing revenues to remain relatively flat



Source: International Data Corp., Framingham, Mass

New books for the network manager

◆ *Networking Windows NT 3.51*, **second edition, by John D. Ruley, John Wiley & Sons, Inc., New York, 665 pages, $32.95 (paperback)**

Ruley and a team of Windows NT specialists — David Methvin, Martin Heller, Arthur Germain III and Eric Hall — update their book on installing NT in a networked corporate environment. The book handles the basics, starting with installation, and progresses to more complex topics. These include how to integrate NT with Unix, OS/2, Novell, Inc.'s NetWare and other operating systems; how to handle administration and support across the enterprise; and how to develop client/server applications.

◆ *PC Networking Handbook*, **by Ed Tittel, Academic Press, Inc., Chestnut Hill, Mass., 857 pages, $39.95 (paperback)**

Tittel, a code jockey and Novell, Inc. employee turned writer, has now written 13 books on networking. This book is a general handbook and covers five major topic areas: cabling and media, technologies and access methods, protocols, equipment and management. It has a 36-page glossary of terms and several appendices on how to find vendors and resources for building networks. The book is a well-organized primer for those seeking basic information about LANs.

◆ *Wireless. The Revolution in Personal Telecommunications*, **by Ira Brodsky, Artech House Publishers, Norwood, Mass., 276 pages, $50 (hardcover)**

A respected figure in the communications business, Brodsky applies his critical eye to wireless systems. He covers the basics behind wireless transmission and the politics of building wireless networks. He then devotes the rest of the book to the many types of services. Each chapter is organized with a separate bibliography. Brodsky covers the pros and cons of each technology, giving each a business assessment and providing extensive context.

◆ *NetWare 4.1. The Complete Reference*, **second edition, by Tom Sheldon, Osborne McGraw-Hill, Berkeley, Calif., 917 pages, $39.95 (paperback)**

Sheldon, a Certified NetWare Engineer, says this book is the most comprehensive guide for the latest version of Novell, Inc.'s NetWare. It certainly is thick enough to fend off most house pests. Written for users at all skill levels, the book features nine parts, each with several chapters devoted to topics including understanding network technology and managing NetWare Directory Services.

Microsoft provides easy access to IBM hosts

Solves problem of integrating SNA networks with TCP/IP-based devices

By Laura DiDio

SNA networks

An enhanced SNA software package that includes improved TCP/IP and remote office support is due from Microsoft Corp. this month.

The SNA Open Gateway Architecture (SOGA) will make it cheaper and easier for PC users to access IBM hosts across the enterprise. That is because it solves the traditional problem of integrating IBM Systems Network Architecture (SNA) networks with TCP/IP-based LAN devices, said Vesa Suomolainen, general manager of Microsoft's SNA Server product.

SOGA is part of SNA Server, client/server software that Microsoft bundles with its BackOffice suite. It connects PCs to IBM mainframes and midrange AS/400 systems via Windows NT Server. NT performs the necessary communication handshakes and protocol conversions that let LAN-based PCs access data on SNA networks.

SOGA extends SNA Server functions to the wide area. It gives businesses scalability and a variety of connectivity options to meld branch office traffic via routed LAN internetworks with corporate IBM mainframes and AS/400 systems. It incorporates a feature called the Distributed Gateway Service that lets users install SNA servers in branch offices and connect to SNA servers at the corporate office.

Distributed Gateway Service uses native TCP/IP, Novell, Inc. IPX or Banyan Systems, Inc. Vines protocols.

Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, said the Distributed Gateway Service is a boon for users because it minimizes cost and response time.

Users who are testing it agreed.

Users pleased

Rick Shope, manager of PC planning and technology at NationsBank-CRT in Chicago, a subsidiary of NationsBank Corp., said the bank is so pleased with SOGA's reliability and cost savings that it will switch from NetWare for SAA.

Shope said NationsBank-CRT, which has wide-area links to offices in London, Tokyo, Singapore, New York and Charlotte, N.C., has had no problems in two months of testing SOGA.

By contrast, NetWare for SAA "regularly drops our [wide-area network] connections. And it also has difficulty handling a lot of data when we process the end-of-month reports — our print jobs just die," Shope said.

The TCP/IP support in the SOGA gateway will let NationsBank-CRT preserve its investment in internetworking hubs and routers.

Similarly, The Finnish Bank in Helsinki will deploy the Distributed Gateway Service in SOGA to consolidate its 12,000 PC wide-area network links to host computers to just 600 — one for each of its SNA Server-to-host links.

Briefs

Avanti upgrades NodeInfo

Avanti Technology, Inc. recently upgraded NodeInfo, a Windows-based tool kit for help desks and administrators that support Novell, Inc. NetWare LANs. Version 2.0 of NodeInfo adds the ability to safely close files and clear locked files without terminating user connections. This prevents network errors that can crash Windows and destroy a user's work, according to the Austin, Texas, company. NodeInfo 2.0 handles NetWare Directory Services and the original bindery database. It costs $295 per server.

Analyzer on NT

Network managers and application developers who prefer Windows to Unix can add a protocol analyzer to their tool kits. Atlanta-based Cinco Networks, Inc. recently upgraded its NetXRay analyzer and network monitoring software, adding a version for Windows NT. New capture/decode support covers Token Ring and 100VG-AnyLAN networks.

Time to Rumba

Microsoft Corp. and Wall Data, Inc. in Kirkland, Wash., have inked a deal to combine their respective software products into a single, less expensive package that will be resold by distributor Tech Data, Inc. The pact calls for Microsoft to integrate its SNA Server gateway software with Wall Data's Rumba Office emulation software, which lets PCs connect to IBM mainframes and AS/400s. The package, called Rumba SNA Server Solution Pack, will cost $1,404; it includes a license for a single server and five clients. The same software purchased separately costs $3,234, a Microsoft spokesman said.

Kofax makes buy

Kofax Image Products in Irvine, Calif., recently signed a letter of intent to acquire LaserData, Inc. in Tyngsboro, Mass. Kofax provides document imaging software. LaserData manufactures optical storage software. The terms of the acquisition haven't been disclosed.

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BRIEFS, 64

The Internet

WORLD WIDE WEB • INTRANETS • ON-LINE SERVICES

Building 'net applications

Tools ease development of non-Web apps

By Frank Hayes

There's more to the Internet than the World Wide Web — and two old networking hands haven't forgotten that.

While other tool vendors rush to support the Web, longtime Internet vendors NetManage, Inc. and FTP Software, Inc. are rolling out tool sets designed for a different purpose: making it easier for developers to build applications for the Internet itself.

NetManage's NEWT-SDK 5.0 lets developers stitch electronic mail, file transfers and network management into Windows-based applications. FTP Software's CyberAgent development kit offers a scripting language for building "intelligent agents" that can perform network management tasks and search out information on the 'net.

Both tool sets were designed for ordinary developers, not just networking gurus, according to Scott Lemon, president of Network Integration, Inc., a consulting firm in Heber City, Utah.

"It's not that they provide much easier tools for my expert developers; it's more that they will allow me to put a different kind of developer on the same project now," said Lemon, who has tested NEWT-SDK.

The $500 tool set, which began shipping last month from NetManage in Cupertino, Calif., is a set of components that can be used with Microsoft Corp.'s Visual Basic, Borland International, Inc.'s Delphi and other development environments.

Protocols supported

The components support the Simple Mail Transfer Protocol, File Transfer Protocol, Simple Network Management Protocol, terminal emulation and other network functions. There is no deployment fee for corporate applications built with the components.

The FTP CyberAgent development kit takes a different tack, with a scripting language that lets developers build programs that will run on their own across the network, said David Harper, a network administrator at Tufts University in Medford, Mass., who has used CyberAgent.

"For example, if someone has a machine that isn't working, I can send an agent to get their configuration, and then make changes and send it back to them, without any intervention on the part of the person whose machine I'm fixing," Harper said.

The $495 tool kit, which ships this month, includes debugging tools and sample source code for building the network agents.

But the CyberAgent's Trac scripting language, which was developed at MIT, may be tough for some developers to master. "Right now this is not for beginners," Harper said. "Trac is conceptually quite different from most other computer languages, and it's not obvious to your standard C programmer how to use it."

However, CyberAgent also includes tools that can automatically generate agents for certain tasks. FTP Software plans a version that won't require using the scripting language at all, according to the North Andover, Mass.-based firm.

Beyond the Web

Most of the attention that the Internet attracts is focused on the Web, which integrates E-mail, file transfers and other functions.

But with appropriate tools, developers can integrate those functions into more conventional applications.

Bring 3-D virtual reality to your Web pages

Users will visit your site with a joystick or mouse

By Mitch Wagner

Web tools

World Wide Web publishers will find it easier to bring their Web pages into the third dimension with a tool designed to automatically convert typical two-dimensional Web pages into 3-D "virtual reality."

"It's an easy way to add 3-D to your site without having to use expensive, proprietary software and devote a lot of time to it," said Eric Olinger, president of Tenet Networks, Inc. in Carlsbad, Calif. Tenet wrote the software and licensed it to WebMaster, Inc. in Santa Ana, Calif., for distribution.

VRServer takes data written in Hypertext Markup Language (HTML), the standard language used for formatting Web pages, and converts it to Virtual Reality Modeling Language (VRML). VRML is a set of extensions to HTML that can be viewed through special add-on software for standard Internet browsers. VRML code can be displayed on any standard Web server software.

Rather than looking at a two-dimensional "page," as with an ordinary Web site, a VRML document appears to be a three-dimensional space that users can look at from all angles and move through by swooping and swerving, piloted by a mouse or joystick.

The effect is similar to "fly-through" software used in architecture, engineering and design. Adding VRML functionality to a page is like using the latest special-effects technology in a movie — it attracts traffic by drawing in people eager to check it out.

Automatic updates

As changes are made to HTML documents, the same changes are automatically made to their VRML equivalents. Users who want to take advantage of both

3-D Web pages, *page 64*

Bernie Hayes

CompuServe restricts access

By Torsten Busse

Banned on-line

CompuServe users got a post-Christmas present that left them none too happy.

The on-line service suspended access to more than 200 Internet newsgroups worldwide on Dec. 28, citing pressure from German authorities that arose out of a child pornography case.

The surprise move sparked strong protest from subscribers, who charged the service with censorship.

CompuServe said the ban is temporary. Once it finds a way to restrict access to the Internet on a geographical basis, it will restore services outside of Germany. But the company acknowledged that it did not know when it could do this.

German authorities, meanwhile, pointed out that they did not order the on-line service to take the action.

"We only notified [CompuServe] about what is illegal under German laws. The decision which and how many newsgroups would be taken off-line was a decision made by CompuServe," said German prosecutor Manfred Wick. "We never mandated anything."

A spokesman at CompuServe, Inc. responded that "mandated may not be the right word to use, but the fact of the matter is that the German government came to us saying, 'Currently, we believe you are in violation of German laws, and here are the newsgroups that contain the content that violates our laws.' So we took the appropriate actions."

Most of the newsgroups identified by German authorities carry the alt.sex suffix.

Busse is the Munich correspondent for the IDG News Service.

Bring 3-D virtual reality to Web pages

CONTINUED FROM PAGE 63

HTML and VRML don't have to maintain two separate sites to do it.

"This stuff does everything for you. It's amazing," said enthusiastic user Michael Coleman. He is art director at the Internet Shopping Network, a Palo Alto, Calif., company that sells 40,000 consumer and computer products over the Internet (http://www.internet.net).

"I have a Silicon Graphics server that will do complex modeling — but here's something that will do the same thing. It's very simple," Coleman said.

VRServer passes HTML documents, after they are posted, through a filter that gives them one of four appearances: a bare room, medieval castle, spaceship or office.

The text and images included in the original HTML document are portrayed as artwork that appears on the walls of the VRML rooms, Olinger said.

Users of VRServer can modify the images that VRServer creates. They also can create their own templates for VRML documents.

Pricing information

The software costs $249, runs on Windows NT and is available now from the WebMaster home page at http://www.webmaster.com/.

It includes a separate module for authoring VRML documents, which runs on Windows NT or Windows 95.

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VRML browsers, demos are on Web

You don't have to have a monster workstation or a high-speed Internet connection to view Virtual Reality Modeling Language (VRML) documents. The modem and PC you have on your desk right now probably are fine.

VRML was developed in 1994 at Silicon Graphics, Inc. It is a simple language, similar to HTML, that is used to define spaces that appear to be three-dimensional. This means users can "fly" through them and view objects from all directions.

VRML sends information about a "room" or "space" down the modem line to your local system, and then your local system handles the movement through the virtual reality space. The amount of data needed to describe a virtual reality space can be very small, no larger than a conventional, two-dimensional Web page. However, typical documents are larger to accommodate richer graphics.

You need a bit more processor power to view VRML objects than you need for conventional Web pages. WebMaster, Inc. in Santa Clara, Calif., which makes VRML software, recommends at least a 50-MHz 486-class PC; by contrast, 386-class machines are OK for viewing standard two-dimensional Web pages.

You can find a list of VRML browsers, many of them freeware or shareware, at the VRML Forum (http://vrml.wired.com/) or the VRML Repository at the San Diego Supercomputer Center (http://www.sdsc.edu/vrml). Many of these browsers function as add-ons to browsers such as Mosaic or Navigator from Netscape Communications Corp.

Once your VRML browser is set up, you will want to point it at something. VRML sites on the Web include demos from WebMaster (http://vrml.webmaster.com) and Intel Corp. (http://www.intel.com). There also is a silly Virtual SoMa page on the 'net (http://www.hyperion.com/planet9/vrsoma.htm). It is a 3-D model of the SoMa section of San Francisco (SOuth of MArket Street — isn't that cute?). This site was prepared by Planet 9 Studios, a San Francisco computer animation company.

—*Mitch Wagner*

Briefs

IBM creates 'net software center

IBM recently said it is launching an Internet software porting center in San Mateo, Calif. The center will allow software vendors to use the Internet to test their Internet applications on IBM's RS/6000 Unix systems.

It's Alphaworld

Worlds, Inc. has a beta version of its Alphaworld software available on the Internet at http://www.worlds.net. The software lets Internet users communicate with one another in a three-dimensional environment. Each user takes the identity of an animated character or icon that other users in the environment can see.

Netscape signs up integrators

Mountain View, Calif.-based Netscape Communications Corp. has signed systems integrators to package consulting services with Netscape's World Wide Web products for building internal Internet, or intranet, applications. The vendors are Andersen Consulting, Claremont Technology Group, Electronic Data Systems Corp. and Fujitsu Corp.

Hummingbird buys Common Ground

Hummingbird Communication Ltd., a vendor of Internet connectivity products in North York, Ontario, acquired Common Ground Software, Inc., a small document-sharing software maker in Redwood City, Calif., late last month for $6 million.

CompuServe adds services

CompuServe, Inc. has added more information sources to Enterprise Information Link, its Notes-based information service. Enterprise Information Link now offers users The Burton Group, which tracks the PC industry; several sources of information for Notes; The Value Line Mutual Fund Survey; and Morningstar's stock and funds report. Also available are "The Kiplinger Washington Letter" and "Kiplinger Tax Letter."

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IBM MIDDLEWARE MAY PLAY ROLE IN MERGER OF INSURERS, 68

Corporate Strategies

CASE STUDIES • TRENDS • OUTSOURCING

Insurers start to pull back from OS/2

By Lisa Picarille

Throughout IBM's trials and tribulations with trying to make OS/2 the corporate desktop operating system of choice, the system's stronghold in the insurance field has been relatively stable — until now.

Although IBM still boasts an impressive list of insurance clients — Chubb Life Insurance Co. of America, for instance, has more than 20,000 copies of OS/2 — several other large users are switching to a combination of Windows 95 on the desktop and Windows NT on the server. Those users include Travelers Insurance Co. and State Farm Insurance Cos.

New attitude

Just a few months ago, IBM touted the fact that State Farm was preparing to roll out more than 10,000 desktops with OS/2 Warp and Warp Connect. Now, State Farm spokesman Matt Sorenson confirmed, the Bloomington, Ill., insurance giant is employing a philosophy called "managed choice." The idea is to let information systems managers implement the operating system that works best for their needs.

Under this new plan, a "substantial" number of users will migrate to NT, Sorensen said. State Farm has more than 7,000 seats of OS/2 and hundreds of Macintoshes.

As for Travelers, sources inside the Hartford, Conn., firm said the company also is transitioning to Windows 95 and NT. The move is because of the lack of software for OS/2 and worries about IBM's commitment to the operating system. No one at Travelers would comment about the switch.

John Soyring, director of strategic relations at IBM's Personal Software Products Division in Austin, Texas, wouldn't comment on Travelers or State Farm. He did say, however, that IBM recently won some new insurance customers, but he wouldn't name them.

No assurance for OS/2

- Most were early adopters of client/server technology
- Only OS/2 provided multitasking for the desktop
- Only reliable transaction engine available at the time

- Lack of third-party OS/2 software
- Lack of OS/2 development tools
- IBM late delivering a version of OS/2 with symmetrical multiprocessing
- Some users are afraid IBM isn't committed to OS/2 long term
- IBM recently started supporting Windows NT applications
- Microsoft has done a better job positioning Windows NT
- Windows NT is more scalable

Source: Peter Kastner, an analyst at Aberdeen Group, Inc., Boston

Not all insurance companies are making the move. One loyal OS/2 user said his company has no plans to go to NT.

"OS/2 is our corporate standard, and fortunately no one is thinking of moving off OS/2," said Roger Perkins, a senior IS analyst at Blue Cross/Blue Shield of Western New York. There are 600 copies of OS/2 throughout Blue Cross, which is upgrading to Warp Connect. "OS/2 is easy to support and offers a lot of connectivity options," he said.

Others who implemented OS/2 years ago also are sticking with it — for now.

"We made a decision four years ago to re-engineer our business process using OS/2. At that time, if you wanted multitasking, OS/2 was the only game in town," said Frank Petersmark, technical services manager at Amerisure Cos., a Southfield, Mich., insurance firm with 1,000 seats of OS/2 2.1. It is migrating to OS/2 Warp Connect over the next year.

But Petersmark still has had to defend his choice of operating system, especially in light of the Windows 95 marketing blitz.

"Microsoft has the mind share and the market share, and I've had to defend OS/2 from day one. But as long as we are meeting our business requirements, we will stick with it," he said.

But some users abandoned

OS/2, page 68

Officials tap IS to protect the City of Angels

Center almost ready to coordinate emergency relief efforts

By Jean S. Bozman
EAST LOS ANGELES

After four years of work, Los Angeles County's command and control center, wired to coordinate all emergency response efforts, is in its final round of tests before being certified for action.

The county spent $26 million building the self-sufficient, highly secure center.

The Emergency Operations Center (EOC), which opened in April, hasn't yet endured its first major disaster. The center was built to withstand an earthquake registering 8.3 on the Richter scale and can handle any emergency in the city of Los Angeles in cooperation with the city's police and fire departments (see story at right).

The EOC isn't in full production mode yet, according to information systems administrator Amy Jaffke. "We still need to sign off on the system as final and complete," she said. That final sign-off is expected this month.

The EOC's network of Unix-based servers and workstations was designed by Lockheed Martin Integrated Solutions Co. in Santa Clara, Calif., a unit of Lockheed Martin Corp., the military contractor.

Two Sun Microsystems, Inc. SPARCserver 1000 Unix servers are at the heart of the system. The servers are tied to one another and to a shared RAID disk array in case one server fails.

An Oracle Corp. 7.1 database on one server collects information about incidents that occur during any big emergency, including the fires, road closures and power failures that can happen during a major earthquake. A custom software link passes the Oracle data into geographic information systems databases from ESRI, Inc. that run on the second Sun server.

Planners in the EOC's situation room can view that merged data on three 6- by 8-ft. screens against a backdrop of the local streets and highways. Then they can dispatch units to help in emergency relief efforts.

"As you're sitting in the situation room, you're seeing events come up on the map," Jaffke said.

There are 85 Sun workstations inside the EOC that can show Emergency Management Information System (EMIS) data. There are 28 more EMIS workstations at county agencies that can tap into the central servers.

Emergency center, page 68

Los Angeles police take software to streets to pinpoint crime scenes

2

By Julia King

It was right around midnight on a dark street in the Van Nuys section of Los Angeles when police Sgt. Brian Collins noticed sparks coming from inside a parked car and feet hanging out of the driver's side door.

"At first, it was kind of a surprise. I thought it was amazing that I could stumble upon something like that based on information given to me," Collins recalled.

But amazement quickly turned to action as Collins and his partner arrested a suspect for grand theft auto.

Mapping software

Making it easy

The information Collins had that night — the exact street locations of previous car heists, the times of the heists and the makes and models of the stolen cars — was on a single map generated by an evolving client/server-based crime analysis system.

Efficient and accurate mapping of crime data has become increasingly critical in Los Angeles, where some 40% of all California crimes are committed. Color-coded maps detail data by location, time and suspect and function as powerful visual aids in situations where time is of the essence.

"When we put officers out on the streets with better information, they know who to look for and what to look for," said Sgt. Gary Nanson, who heads up the police department's crime analysis unit.

"Officers also are willing to use the maps, which is key," he added. "If we gave them a stack of reports, they don't have the time to read them. But if we give them one or two maps, they will use those."

At the heart of the new system is mapping software from Troy, N.Y.-based MapInfo Corp. It was first deployed on individual PCs in

Mapping software, page 68

Connecticut Mutual ensures legacy longevity

IBM's MQSeries may help ease merger with MassMutual

By Thomas Hoffman

By the time Connecticut Mutual Life Insurance Co. completes its merger with MassMutual Life Insurance Co. later this quarter, information systems staffs from both firms will be busy cobbling together the combined entity's systems.

But well before the "M"-word was even whispered between the venerable New England insurance giants, Connecticut Mutual was hip-deep in re-engineering its own systems infrastructure.

Like many other companies, the Hartford, Conn., insurer was looking for a way to protect its investment in its legacy systems — which are more than 20 years old — while making multiplatform applications more accessible to its employees.

Software in common

The company is installing IBM's MQSeries middleware to bind its legacy systems to newer, client/server-based applications.

Since MassMutual in Springfield, Mass., also has explored the use of the IBM middleware for its operations, chances are good that the software may play an important role in the consolidation of systems during the merger.

Message-driven middleware

MQSeries is a message-driven middleware package that directs traffic among disparate computing platforms.

For example, if a user is logged on to a Novell, Inc. NetWare LAN and needs to access IBM mainframe data, MQSeries will juggle commands between the two platforms via electronic messages.

The IBM software package, which synchronizes VSAM customer files between batch processing and CICS systems at Connecticut Mutual, helps to streamline several time-consuming operations.

Customer inquiries can be answered much more quickly now because customer service representatives can launch queries directly at the appropriate customer information system.

In the past, the service representative might have had to log in separately to a Wang Laboratories, Inc. VS 10000 system and an IBM ES/9000 mainframe to gather the necessary policy information.

Keeping up

"This is an issue that's being addressed by every major financial institution," said John Alexander, president of Business Technology Consulting, Inc. in Portland, Maine, and former chief information officer at Unum Life Insurance Co. in Portland.

"They've all got software that's still running well, but it's software that's old enough to vote. It needs to be reconfigured to work with today's business models," Alexander said.

By using MQSeries to send messages to the mainframe and trigger transactions, Connecticut Mutual eliminated 6 million transactions per month just 45 days after installing the middleware.

At a glance

Company: Connecticut Mutual Life Insurance Co., Hartford, Conn.

Challenge: To simplify communications among applications running on different computing platforms as a means to improve customer service.

Technology: IBM's MQSeries messaging system; IBM ES/9000 Model 720 mainframe; IBM RS/6000 machine; Digital Equipment Corp. MicroVAX systems; Wang Laboratories, Inc. VS 10000 minirange systems.

Results: Processing personal history reports in hours instead of weeks.

The reduced mainframe cycles let the company skip a planned upgrade to an IBM ES/9000 Model 820 machine, said Jerry St. Marie, manager of on-line systems solutions at Connecticut Mutual.

The company's $3,000-per-month software licensing fee for the mainframe portion of MQSeries "paid for itself very quickly," St. Marie said.

In its underwriting area, the insurer cut the process of generating reports on prospective customers from several weeks to a matter of hours.

With the shift last month to an MQSeries message-driven process, personal history reports are now sent by an insurance agent to a mainframe-based IBM CICS system and shuttled to an SQL server on an IBM RS/6000 machine.

The old process electronically shuffled such reports among 15 to 30 points of potential failure.

Other projects

The company also has launched other message-driven projects.

It recently created an electronic "in-basket" where employees can work together on the same agent contract files.

The in-basket was built using an MQS-based application and a Sybase, Inc. relational database application.

Emergency

CONTINUED FROM PAGE 67

Incoming data is entered on the EMIS workstations, which averts the types of snafus that have occurred in the past because of incompatible systems or paper-based record keeping.

Previously, incompatibilities and paper records created delays and sometimes errors when data had to be reentered as it moved from one computer system to another. Now, each remote unit in the new system "keeps itself synched" with central databases so the system can still function if data communications with the EOC is temporarily lost, said Leroy Lacy, a systems designer at Lockheed.

In the name of consistency and security, the EOC's EMIS keeps all data trapped within the Unix network. EMIS workstations, including those at the remote sites, already are authenticated devices on the network, said Lt. Stephen Gattis, operations manager for the EOC project. But outsiders who might want to log in from their own PCs can't dial in, he said.

The dedicated workstations use an encrypted protocol to authenticate users.

For safety, there aren't any direct links to the Internet, although EOC users can tap the internet on their PCs.

There aren't any PC LANs at the center even though individuals can power up their PC laptops there and generate WordPerfect documents on 30 stand-alone PCs.

Mapping

CONTINUED FROM PAGE 67

the Los Angeles Police Department's 18 divisions; now the software is being migrated to a Compaq Computer Corp. ProLiant server that Pentium-based PC clients running Windows NT will access over a wide-area network.

Crime data will be stored in a Microsoft Corp. SQL Server 6 database or in a relational database from Sybase, Inc. The decision has yet to be made.

Going client/server

One of the key reasons for migrating to a client/server setup is that it will significantly increase the amount of information the department's crime analysts can feed to fellow cops cruising the beat.

Now, for example, crime analysts can download from an IBM mainframe only that data that applies to their division.

This data is stored in a Paradox database against which the MapInfo software can run.

Under a client/server architecture, by contrast, all analysts in all divisions will have access to all crime data citywide.

Wide-area network

The Los Angeles Police Department is charged with protecting 3.5 million citizens spread out over 460 square miles.

"The goal is to quit looking at crimes individually and instead group them together by the same suspect or same MO," Nanson said.

"With client/server, we'll also be able to centrally manage the system and get away from having two databases," according to Collins, who provides technical support for the MapInfo system.

Looking ahead, Nanson said the plan is to do away with traditional paper-based maps altogether and give officers instant access to maps from mobile digital computers mounted in patrol cars.

Briefs

Going platinum

Following Microsoft Corp.'s lead, graphics software vendor Micrografx, Inc. has announced it will push a Platinum plan — a volume licensing, maintenance and support plan for its products.

Taking it to the bank

BancTec, Inc. has received orders totaling $17 million for its image-based payment processing software. Customers include Sears, Roebuck and Co., First Interstate Bank, GTE Communications Systems Corp., Commerce Bank of Kansas City and General Electric Capital Corp.

OS/2

CONTINUED FROM PAGE 67

OS/2 years ago and aren't returning.

"We picked Microsoft and NT for a variety of reasons: lots of features, built-in security, and there is much more third-party software available," said R. Max Gould, chief technology officer at Aetna Life & Casualty Co. in Hartford, Conn.

Aetna has more than 41,000 desktop systems running Windows 3.11 and plans to transition to NT in the next several years.

According to David Card, an analyst at International Data Corp., a market research firm in Mountain View, Calif., there are a lot of reasons why IBM obtained a stronghold in the insurance industry — and Microsoft is now gaining a foothold on those OS/2 shops.

"OS/2 was originally positioned as IBM's future [operating system] for distributed computing. It plugs in to DB2. It has good tools support. There was good support from IBM and value-added resellers. It was a very legitimate choice, and IBM cultivated those users in insurance," Card said.

But, Card added, now that there is another 32-bit, multiprocessing and multithreaded operating system on the horizon, "insurance companies and other typical IBM shops are now reevaluating their decisions. There is another legitimate contender, and it's NT."

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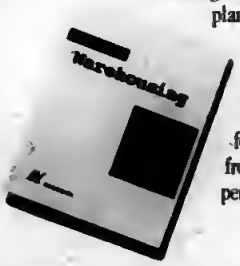
Once accessed, data must be transformed into a consistent, integrated form. The SAS System cleans, reconciles, de-normalizes, and summarizes data. Then, it loads data into logical views that can be surfaced into a variety of analytical and reporting applications.

THE FRONT END: EXPLOITING THE DATA

Once data arrive in the warehouse, an arsenal of capabilities is available for querying, analyzing, and reporting on that data. These tools include OLAP/multidimensional analysis, data visualization, information and presentation graphics, forecasting, operations research, financial management, and more.

PLUS A FREE CHECKLIST TO GUIDE YOU



Building a successful data warehouse requires careful planning. Luckily, information managers everywhere can have the facts at their fingertips with SAS Institute's *Checklist for Data Warehousing Success*. We've included practical tips for approaching data warehousing from corporate, business, and IT perspectives.

To receive your free *Checklist*, give us a call or send us e-mail at cw@sas.sas.com

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Managing

David Garets reads the trade press to keep current

STEVE WILSON

David Garets

Chief information officer
Magic Valley Regional Medical Center
Twin Falls, Idaho

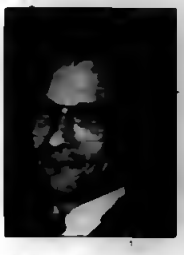
"The best way to keep up is to read the trade press, and read enough of them so you don't just get one publication's bias. The really good stuff is in the magazines that publish in-depth stories, such as articles about the latest in switched Ethernet or what all the vendors are doing. That's more helpful to me than the self-serving stuff that sometimes appears in product announcements.

"Historically, [information systems] people rely on their vendor to tell you what's going on, and that often leaves you blinded to what else is out there. That's why technology update programs, such as the new College of Healthcare Information Management Executives course on 'Emerging Information Technologies in Health Care,' are so important and powerful.

"But there are favorite vendors that I have relationships with and trust. And I spent 13 years in a technical support position at AT&T, so I have friends in that industry [whom] I can ask."

Steve Flis

Network manager
MetroWest Medical Center
Framingham, Mass.



"I read all the periodicals that come to my desk, and I read the publications of the Network Professional Association in Provo, Utah, and go to their seminars. They're slanted toward Novell, so I just take it with a grain of salt.

"When I have a specific question, I go to the World Wide Web and read 'frequently asked questions' in the vendors' technical support area. The Web page of Novell is definitely very helpful.

"It seems like I'm always too busy to go to a lot of the conferences, plus it's a money issue. The Networld/Interop show is not something I go to every year; I haven't found it to be that compelling."

Sean Smith

Systems administrator
Blue Sky Productions, Inc.
Ossining, N.Y.

"I read the journals of the Association for Computing Machinery and Institute of Electrical and Electronics Engineers, whose articles about LAN technologies are about as good as they come.

"A lot of companies have very good technical papers within their Web sites or will point you to places where you can get more information. Internet newsgroups are good for getting basic information, and the newsgroups have other people talking about what they are getting into. The Internet stuff is very close to personal contact because you can throw a question out and get someone to say, 'I did that last week; don't do it.'

"Sometimes you get a chance to schmooze with systems engineers from various companies. They give information that marketing might not want given out, but it's good information."

David Beering

Senior staff telecommunications analyst
Amoco Corp.
Chicago

WALTER P. CALLARD

"I spend a lot of time face-to-face with vendors. I bring them in occasionally or go to visit them to get a read on what they are doing.

"I don't participate in user groups because I don't have time. But the Networld/Interop trade

F.Y.I.

Takeoff!

IS and the 777

Talkback@cw.com How do you find out what's new with PC hardware? We want to hear about your favorite Web sites, newsgroups and conferences. E-mail us at talkback@cw.com or fax the editors of Managing at (508)875-8931.

How do you keep up with networking trends? See if these managers' strategies match yours.

By Steve Alexander

shows are important. I walk trade show floors. If you have a need, sometimes as you walk down the aisles, the solutions jump out at you.

"I think the most important organization I'm involved with is the ATM Forum's Enterprise Network Round Table. We spend a lot of time talking about current technologies in the midst of looking toward the future."

John Robinson

System manager
South Carolina Dept. of Parks, Recreation and Tourism
Columbia, S.C.

"I keep in touch with personal contacts via Internet mail, which makes up for not being able to attend a lot of meetings. I don't attend specific user groups because I just don't have time. I am a member of the Lotus Developer Connection, which allows me to see new things from Lotus in the network arena.

"On the Internet, I regularly go for the computer press Web pages where you can get information four days before it is published. Anytime I can read material on a Friday prior to publication, I feel that I'm three days ahead of the game."

Jim Crozier

Systems programmer, Data Services Group
Florida Department of State
Tallahassee, Fla.

"Most conferences are out of the question for budgetary and time reasons. But I did get to go to a big local one, the Florida Government Technology Conference, put on by a group from Florida State University.

"I've spent a fair amount of time on the World Wide Web in the last six months, using it to evaluate technology and get updates and product information. Digital's home page is really good because it has pointers all over the place."

James Kutsch

Vice president of interactive strategies
AT&T Universal Card Services
Jacksonville, Fla.

"I want to be able to control how deeply I investigate a topic. In the print media, what you read is what everyone reads. But when you get into on-line information, the degree to which you can personalize what you're looking for — maybe by using some World Wide Web search engines to find sites relevant to your topic — gives you a lot more control. You can explore to the depth that you want.

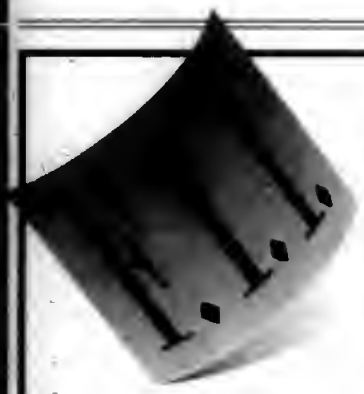
"There are a lot of Internet newsgroups that address LANs. I would equate the newsgroups with traditional user groups. You need a mix of on-line newsgroups and user groups you can go to in person and put some names and faces together. But I can make better use of my time with on-line groups because it reduces the downtime of traveling on a plane." ■

Alexander is a freelance writer in Minnesota.

Suggestion Box

A roundup of recommendations:

1. **Internet Web pages –** These include the home pages of leading LAN vendors, such as Microsoft (http://www.microsoft.com/) and Novell (http://www.novell.com/)
2. **Internet newsgroups –** comp.sys.novell, comp.client-server
3. **Personal contacts**
4. **Direct vendor contact –** All LAN vendors
5. **Trade shows –** Networld/Interop, Softbank Exposition and Conference Co., Foster City, Calif., (415) 578-6900
6. **Industry associations –** Association for Computing Machinery, New York, (212) 869-7440; Institute of Electrical and Electronics Engineers, New York, (212) 705-7900
7. **Specialty associations –** ATM Forum, Foster City, Calif., (415) 578-6860; Network Professional Association, Provo, Utah, (801) 379-0330; College of Health Care Information Management Executives, Ann Arbor, Mich., (313) 665-0000
8. **User groups –** NetWare Users International, Provo, Utah, (800) 228-4684; Association of Banyan Users International, Chicago, (312) 644-6610, ext. 3846; Advanced Systems User Group for Microsoft Corp. Windows NT, Washington, http://cpcug.org/user/ckelly/new_asug.html



CONTINUED FROM PAGE 70

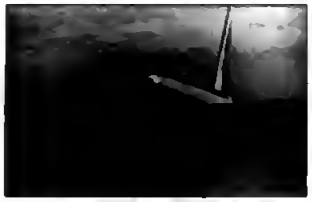
airplane was built.

The program and the companion book by Karl Sabbagh (Scribner, New York, $25), show how engineers at The Boeing Co. exploited information technology to build the 777. But the book contains hardly a word about the people at Boeing's IS organization, Boeing Computer Services.

Henry A. Shomber, a recently retired Boeing chief engineer, says Boeing's IS group played a "heroic" role in the creation of the aircraft. Shomber, an early member of the 777 team, helped lead the development and implementation of the processes used to create the airplane.

The 38-year Boeing veteran praises IS for doing the following:

- Quickly building a global network using a submarine fiber-optic cable. This allowed foreign and U.S. subcontractors to share data with Boeing.
- Reliably supporting 2,400 computer-aided design and manufacturing workstations on eight IBM mainframes. "There were a few crashes," Shomber says, "but they were minimal."
- Moving thousands of 777 project members 40 miles to a new site in one weekend. "This could have been a disaster, but the IS community did a great job," Shomber says.
- Developing in-house software that improved the interface of IBM's CATIA design software. The software also let engineers electronically coordinate their efforts.



The 777's software includes 5 million lines of code, including 2 million lines unique to the 777. There are 1,700 computers, totaling 60% of the 777's computing power, running the passenger entertainment systems. The other 40% is used for flying and navigating the plane.

"Without these actions, we couldn't have built this airplane digitally," Shomber says. Digital design helped reduce errors and rework, a project goal. Physically locating IS personnel next to users was critical to IS' success, he says.

Sabbagh doesn't hone in on IS in the book, but he saw the result of the group's handiwork: the reliability and capabilities of Boeing's systems and how Boeing engineers trusted their systems and took them for granted.

"Every time [Boeing] tried to find new uses for computers on this plane, they found more uses and benefits than they expected," Sabbagh says. "Judging [from] Boeing's experience, *Computerworld* readers will be in business for a very long time."

For more information on the Boeing 777 project, see our World Wide Web site: http://www.computerworld.com/spotlight/index.html. — *Allan E. Alter*

Share lists '96 concerns

Share, the IBM user group, recently released the results of its 1996 Strategic Concerns survey. The Chicago-based group annually polls its 1,800 member organizations to find what issues matter to them most.

Enterprisewide systems management tops the list for the third year running. Mainframes and enterprise servers are second, having rocketed up the charts from No. 5 last year. Collaborative and workgroup computing cracked the Top 10 for the first time.

Top 10 strategic concerns:

1. Enterprisewide systems management
2. Mainframes and enterprise servers
3. Interoperability
4. Enterprisewide security and authentication
5. Client/server computing
6. Network management
7. Enterprisewide storage and data management
8. Application development technologies
9. Collaborative and workgroup computing
10. Workstation/LAN robustness

Power Tools

Manage Pro 3.1

Avantos Performance Systems, Inc.
Emeryville, Calif.
$279 (Individual Edition)
$650 (per seat, Network Edition)

By Jeffrey Angus

Most software is designed to promote quantitative progress. "More," "faster" and "cheaper" are its makers' buzzwords. A software publisher rarely has the guts to aim to improve people's work qualitatively — "better," "smarter," "more responsive."

The most thought-out, quality-enhancing software I've seen is Manage Pro from Avantos Performance Systems, Inc. in Emeryville, Calif. The recently released Version 3.1 has been broken into two products: Manage Pro 3.1 Individual Edition ($279, list) and 3.1 Multi-User Network Edition ($650 per seat, list).

What makes Manage Pro unique is the way it bends to your management role, level of management knowledge and industry.

Manage Pro brings together tools you need to be a modern manager. The software uses the computer to do things you wouldn't do anywhere near as well if you didn't have it. Its functions give an experienced manager the ability to set and list goals and objectives, monitor detail progress, monitor and reinforce individuals' contributions, and reward and recognize contributions. As you delegate activities and establish milestones, the program works like a project management package. As you track and enter progress data, the system prompts you to comment on employee performance.

You could do this on paper, but Manage Pro includes a detailed tickler system that rolls up tasks to any detail level and shows status levels with colored indicator "lights" that quickly show whether you are on track. And it collates and organizes employee reporting and provides a well-structured foundation for employee reviews.

Manage Pro also allows users to sort and view activities by priority (for allocating resources), person (for making midcourse adjustments such as reassigning tasks from the overworked to the underworked) or factors you design yourself. The 35 canned report formats are more than enough.

Manage Pro 3.1 *focuses on quality*

The Multi-User Network Edition provides a shared database model that puts each contributor in charge of his own progress reporting, which lets the manager monitor activities and allocate resources.

The Avantos product is a highly layered program that allows you to slowly introduce features and functions as your competence or interest grows.

The product comes with more than a dozen templates for specific roles in specific industries. The templates are intended to provide a quick, customizable start with sample goals specific to that industry.

A built-in coaching feature provides terse but punchy descriptions of various management processes and how to do them. For managers without training, it's a good primer. For those with more experience, it works as reinforcement.

Although Manage Pro doesn't have a template specific to information systems managers — who typically handle numerous projects — some shops will find the software development template useful. Others with multiple, long-term projects should consider using the real estate developer template, the closest match to that kind of work cycle. In these cases, users will have to modify the template's terms.

Version 3.1 includes beefed-up report customization. It adopts some of the stronger features used in traditional project management products, such as automatic time duration management and the ability to track multiple costs per project.

This product works across the spectrum of styles, industries and experience. It isn't, however, for everyone. As the product has grown, it has exposed a tougher learning curve. And for some industries, such as short-interval periodical publishing, the model doesn't hold up well because the effort required to enter details for dozens of short-term daily or weekly projects outweighs the benefits. It also requires a user commitment — dilettantes won't benefit from Manage Pro.

Angus is a freelance writer in Seattle.

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- 22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr. Tech Planning, Admin Sys.
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- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
- 86. Information Centers/Libraries, Educators, Journalists, Students
- 88. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
- (a) Solaris
- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products ☐ Yes ☐ No

Networking Products ☐ Yes ☐ No

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- 70. Mining/Construction/Petroleum/Refining/Agric.
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Is it knowledge yet?

One of your employees has been solid as a rock for three years. He knows every keyboard shortcut; he knows when the network gets slow; he knows the FedEx guy gets crabby when the Redskins lose.

Now he's leaving the department, and all that knowledge is going with him. How could you have made his know-how a permanent resource?

Eighty companies seeking the answer participated in a recent symposium and survey. In one of the most vexing findings, 91% said they have no way to link knowledge management to financial results or that they do so poorly.

The survey was sponsored by Arthur Andersen in Chicago and the American Productivity & Quality Center in Houston. The firms have jointly developed the Knowledge Management Assessment Tool as an attempt at a benchmark.

FACTOID:

79% of companies surveyed say managing organizational knowledge is important or essential to their strategy . . .

BUT ONLY

15% think they are doing a good or excellent job at it.

Source: Survey of the companies performed by Arthur Andersen and the American Productivity & Quality Center

The results indicate a canyon between where participants are in knowledge management and where they think they should be (see chart). The first organizations that span this gap stand to gain an advantage while their competitors catch up.

For more survey results and a look at the big picture, see "Know-How, Inc." in next week's Managing section.

Rule No. 32: If you build it, it will ship

Jim McCarthy designs software for Microsoft Corp. His book, *Dynamics of Software Development* (Microsoft Press, Redmond, Wash., 184 pages, $24.95), is a blast. It includes 54 rules of thumb for software development teams.

But who's got time to read 54 rules? We've boiled them down for you, and we think you can apply these so steps to any type of project management:

1. Establish a shared vision (McCarthy's Rule No. 1).
Though it's obvious, McCarthy writes that this task is "perhaps the most difficult feat of all to pull off."

2. Use scouts (No. 5).
Know the perils ahead.

3. Be an authority, not an authority figure (No. 9).
Don't be a figurehead to your team members; imbue each with power.

4. It's a relationship, not a sale (No. 17).
"They want understanding," McCarthy writes of customers. "Express that understanding in your product."

5. Remember the triangle: features, resources, time (No. 28).
Bingo.

6. Beware of a guy in a room (No. 31).
The most talented worker, locked in an office with a project's toughest assignment, may fail. Even stars must be good teammates.

7. Every milestone deserves a no-blame postmortem (No. 36).
Postmortems are for averting future problems, not hurling invective.

8. When you slip, don't fall (No. 42).
The author looks on the bright side: "You can actually gain a leadership position over the team at the moment of the slip, when they're vulnerable."

9. The world changes. So should you (No. 47).
Flex. Let obstacles be a sign that you need to change course a bit.

10. Create a winning image (No. 54).
"Winners don't talk about winning. They just win," McCarthy writes.

Calendar

The Information Management Forum General Meeting, San Diego, **Jan. 22-24** — Theme: "Realigning our Strategies: Keeping Pace with Business Realities." Speakers include: Lorin Brass, chief information officer of Shell Services Co.; Dennis Courtney, CIO of Dunlop Tire Corp.; and David Drew, CIO of 3M Co. Contact: Information Management Forum, Atlanta, (770) 455-0070.

JAD Facilitation and Implementation Seminar Using Object-Oriented Software Engineering, Greenwich, Conn., **Jan. 29-31** — Focus: managing and facilitating for joint application development (JAD) projects. Fee: $1,475. Contact: Pierson Applications Development, Inc., Stamford, Conn., (203) 322-1606.

Building and Developing Key Data Warehousing Strategies, Dallas, **Jan. 23-25** — Focus is on learning how to harness unstructured data, decrease response time and predict customer buying patterns. Workshops: "On-line Analytical Processing: Retrieving and Utilizing Strategic Data through Multi-tiered Architecture" and "Building Blocks to Successful Data Mining." Contact: Global Business Research, Inc., New York, (212) 645-4226.

Improving International Competitiveness in High-tech and Electronic Manufacturing, Dallas, **Jan. 29-30** — Topics include reorganizing the information technology infrastructure at your company, the challenges of introducing software and emphasizing flexibility to improve your capabilities. Contact: ICM Conferences, Inc., Chicago, (312) 540-5687.

Insurance, Banking and Financial Services: Information Technology Systems Conversion for the Year 2000. New York, **Jan. 29-30** — Focus is on strategies for sizing, planning and converting systems for the millennium. The featured speaker will be Peter de Jager of de Jager & Co. Officials from Bank of Boston Corp., The Chubb Corp., Unum Corp., Merrill Lynch & Co. and Cigna Corp. will also speak. Contact: IBC USA Conferences, Inc., Southboro, Mass., (508) 481-6400. Or visit the conference Web site: http://www.ic.org/~ibc/it2000/.

CAMUS International 1996 User Forum, San Jose, Calif., **Jan. 21-24** — For users of Computer Associates International, Inc.'s CA-Manman, CA/Manman/X and CA-Maxcim. Topics include re-engineering CA-Manman products and adding extensions to CA-Manman and CA-Maxcim for use in a client/server environment. Keynote speaker is Jay Martinson, CA's vice president of manufacturing systems. Contact: CAMUS International, Utica, N.Y., (315) 735-9773.

Eighth Annual SURF Conference, Orlando, Fla., **Feb. 4-8** — Presented by the Sequent Users' Resource Forum (SURF). Speakers include Joe Head, founder of ODS, and executives from Sequent Computer Systems, Inc. Contact: SURF, Beaverton, Ore., (800) 640-7873.

Comnet '96, Washington, **Jan. 30-Feb. 1** — The conference spotlights communications and networking tools. Speakers: Jim Barksdale, of Netscape Communications Corp.; and Eric Schmidt, chief technology officer of Sun Microsystems, Inc. Contact: MHA Event Management, Norwood, Mass., (800) 545-3976.

Call Center '96, Dallas, **Feb. 7-9** — The conference includes technical and managerial tracks. Topics include intelligent call processing, Internet and World Wide Web linking and agent tools. Contact: Advanstar, Eugene, Ore., (800) 331-5706.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

Steve Ulfelder, Associate Editor/Managing, Computerworld, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 875-8931.

[illegible] across the Channel [illegible]

[illegible]

[illegible] and storage [illegible]

[illegible] engineers and construction [illegible]

[illegible] tons of rail

[illegible] drawings and documents.

[illegible]

And one optical jukebox to pull it [illegible]

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Eurotunnel turns to Hewlett-Packard to get the largest private engineering project in history on line.

[redacted]

If you think building the Channel Tunnel was a feat, try managing the records. To get out from under its paperwork, Eurotunnel needed a reliable storage technology that could handle more than a quarter of a million documents, allow users at multiple sites to simultaneously access those documents, and safely archive everything for several decades.

Hewlett-Packard's SureStore Optical Jukebox met all of Eurotunnel's specs. With it, Eurotunnel headquarters was able to route documents swiftly across the network to construction sites in England and France. Workers could access up-to-the-minute files by merely entering a password. And mountains of paper were safely stored on optical disks: in a jukebox about the size of a file cabinet.

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Jan. 9 Managing software development maniacs *By Ken Whitaker*

Jan. 16 Client/server systems management *By Elisabeth Horwitt*

Jan. 23 Corporate Internet champions *By Garrett N. Ray*

Jan. 30 Soundoff: OpenDoc vs. OLE/COM

FEBRUARY

Feb. 6 Data warehousing woes *By Avery L. Jenkins*

Feb. 13 Internet experts forum

Feb. 20 Open Letter to IBM's Lou Gerstner

Feb. 27 Soundoff: Is ATM ready for prime time?

MARCH

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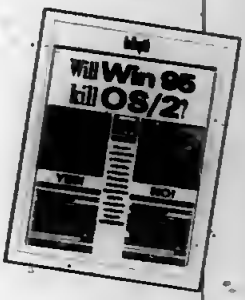

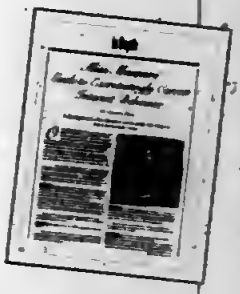

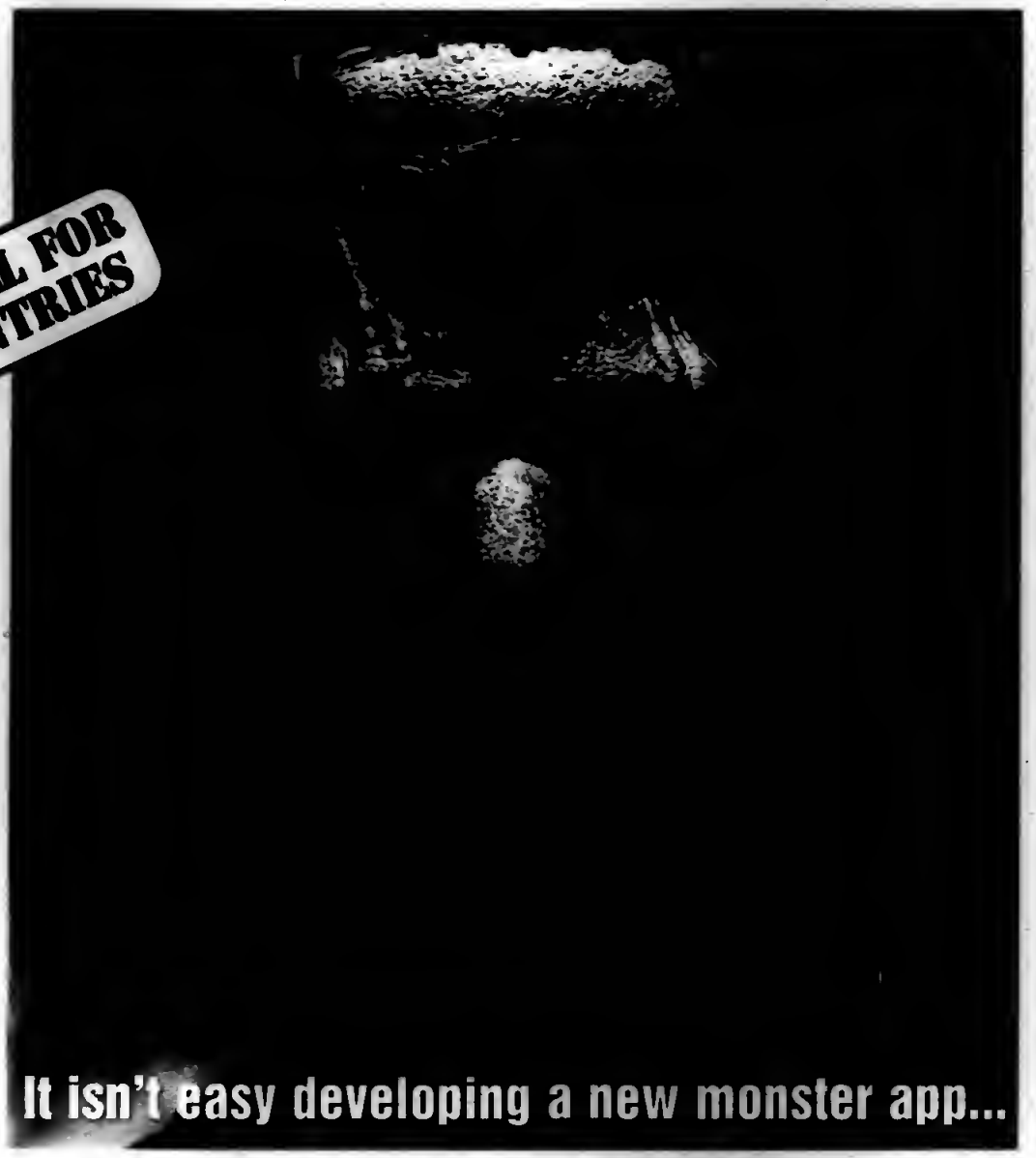

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Windows 95 has put the development spotlight on the Win32 API. But learning it may not be your best career move.

By Daniel Lyons

The popularity of Windows 95 has sparked debate over how quickly developers should embrace the Win32 application programming interface (API) that Windows 95 employs.

Proponents of the Win32 API say it is vital to learn for career growth because Microsoft Corp.'s Windows 95 and Windows NT are fast becoming corporate standards. But others argue that most companies won't migrate anytime soon, and information systems staffers are better off focusing on multimedia, object-oriented programming and the Internet.

The debate over Win32 is new, but the API itself is not. Developers have used the Win32 API on Windows NT for more than two years. An API is a set of guidelines for building applications; developers use standard "function calls" in the API to make applications perform various tasks. By using the API, they ensure their application can share data with other applications.

The Win32 API changes the way some functions were performed in the Win16 API. It also accommodates new features, such as multithreading — a technology that lets an application do more than one thing at once. But even for developers who are familiar with the Win16 API, learning the Win32 API won't be simple.

"Programmers will really have to rethink the way their application programs are written," says John Browne, product manager for Visual C++ at Microsoft in Redmond, Wash.

PRO

There's a compelling case to be made for moving to 32-bit applications. Applications that address functions in 32-bit are faster, and multitasking doesn't work well unless all applications are 32-bit.

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"Our clear direction for the future is 32-bit," says Ian Koenig, director of workstation architecture at Reuters in Hauppauge, N.Y. "All our new applications will be 32-bit."

CON

David Moskowitz, president of Productivity Solutions, Inc. in Norristown, Pa., advises companies on development issues, and focuses particularly on 32-bit environments. The problem with learning APIs, he says, is that you're tied to a particular operating environment, whereas skills in a technology such as object-oriented programming are broader and more transportable.

Similarly, John Viescas, president of Viescas Consulting, Inc., a custom development firm in Redmond, Wash., says developers who want to advance their careers would be better off learning OLE, a key Windows technology, rather than the Win32 API. "If you're doing development in Visual Basic, building end-user applications, you really don't need to know all the ins and outs of the entire Win32 API," Viescas says.

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Lyons is a freelance writer in Ann Arbor, Mich.

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"There's a lot of documentation available on how to move applications from Win16 to Win32," Browne says. One resource is the "Microsoft Systems Journal" newsletter. Also, Microsoft's authorized training centers offer courses about the Win32 API, and the Microsoft Developer Network offers CD-based instruction. Developers can get information about the network by calling (800) 759-5474 or by accessing Microsoft's World Wide Web site (http://www.microsoft.com).

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A buyer's market

Jobs abound for IS professionals with the right skills

By Stephen Alexander

Sears, Roebuck and Co. managed to hire 112 people for its 900-member IS staff through the third quarter of 1995, but it wasn't enough.

Retail industry

"We've got gaps we still need to find people for," said Dennis Hardeland, manager of information systems recruitment for Sears in Chicago. "But I guess [the shortage] is not going to be resolved immediately. There are not enough people gravitating toward IS careers at a time when the needs have been accelerated by the move to client/server, new tools, customers demanding up-to-date information and companies realizing that technology is a critical factor in how an organization stays competitive."

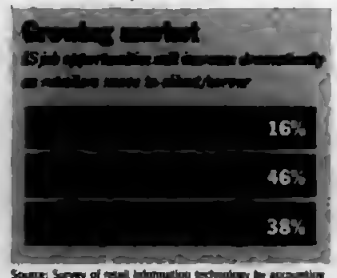
That's the pattern throughout the retail industry as IS shops struggle with a shortage of people experienced in open systems and client/server technologies such as Unix and C++ and products from Oracle Corp. and Informix Corp. Hiring in retail IS shops is so competitive that some are hiring people inexperienced in the retail field or relying more heavily on contractors.

"We've found it particularly difficult and expensive to hire client/server skills such as Sybase and PowerBuilder, which is no surprise," says Rob Hafker, business systems vice president at Saks Fifth Avenue in New York. "In New York City, I have to compete with Wall Street banks that have money to pay and are sucking up the whole New York marketplace for those types of skills."

The Home Depot, Inc. in Atlanta has tilted its recruiting toward people who understand retailing, even if they don't have client/server experience. "We can give them the technical skills they need," says Ron Griffin, senior IS vice president.

But Staples, Inc., an office supply superstore company based in Framingham, Mass., is doing the opposite — hiring technical people without regard for their knowledge of the retail industry. It is doing so to cope with its own growth; the firm expected to open 100 stores and increase revenue by $1 billion in 1995.

"When it comes to a strong technical person [for general IS positions], it is irrelevant whether he or she has retail experience," says Connie Seatter, Staples' management technical recruiter.



Source: Survey of retail information technology by accounting firm Ernst & Young

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To Hardeland, the number of contractors serving the retail industry is just another sign that hiring shortages won't ease anytime soon.

"There are a lot of contract firms, and there's no question they are competing with everyone else for people," Hardeland says. "The more firms you have out there going after the shrinking talent pool, the rougher it is to find people." ■

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Computer Careers

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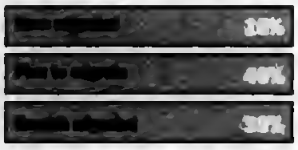
Growing market

IS job opportunities will increase dramatically as retailers move to client/server



Source: Survey of retail information technology by 60 retailers, Ernst & Young

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- **AS400; RPG**

Please apply with a detailed resume indicating geographical preferences to: **Resource Manager, Hi Tech Consultants, Inc., 28077 Northwestern Hwy., Suite 200, Southfield, MI 48034-8281; Ref. 96/01** Tel # (810) 356-2500. Fax # (810) 356-3386

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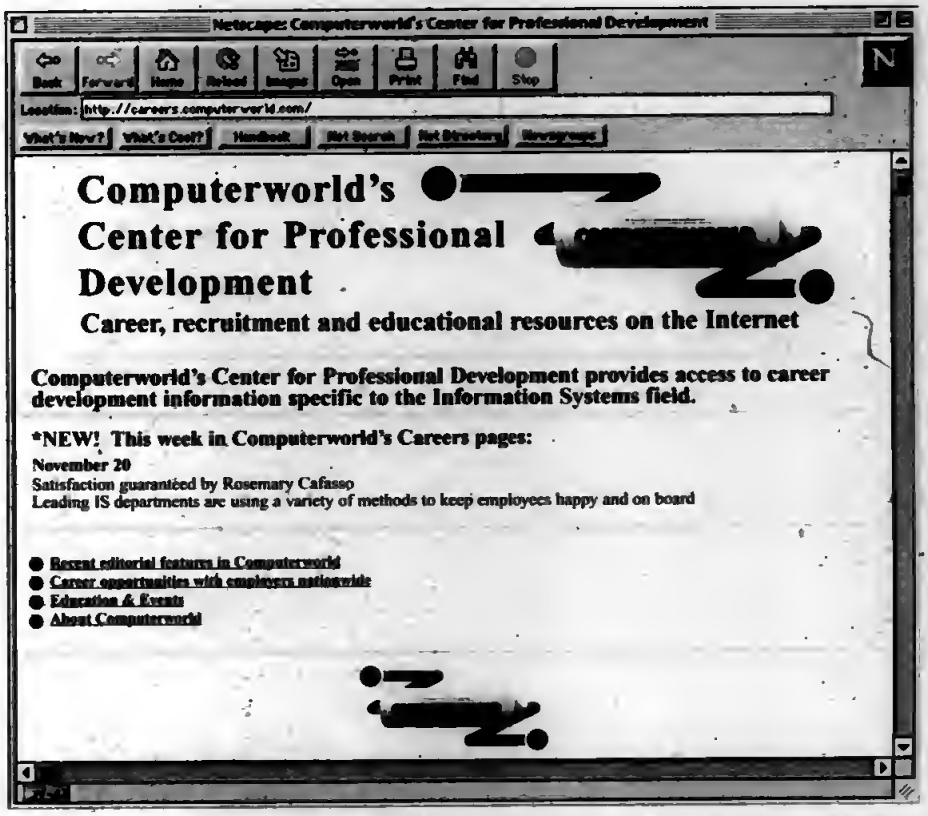

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Programmer/Analyst. Will design, develop, modify, and create various packages using principles of math and statistics to modify insurance type software products to meet informational needs of our clients. Will modify appropriate software models which are adjusted to meet various hypothetical situations to allow insurance producers the ability to analyze insurance products and present statistical information to clients for their review. Create and adapts software systems, taking into consideration variable actuarial risk factors, investment return scenarios, demographic factors, and various life and health insurance policy considerations. Requires a Master's degree in Computer Science or Math Education to include completion of one course in each of the following: Database Systems, Actuarial Risk Theory, and Demographics. Education to include three months internship in which the individual designed and analyzed software as group health and life insurance purposes. Must have passed one actuarial examination. #150. Hours 9:00 a.m. - 5:00 p.m. 40 hours per week at $37,240 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention Leila Jackson, Reference # V-IL 13780-J. No Calls. An Employer Paid Ad - send 2 copies of resume.

PROGRAMMER ANALYST (Ref 187505) to plan, develop, test & document computer programs applying knowledge of programming techniques & computer systems, evaluate user requests for new or modified programs to determine feasibility, cost & time req'd, compatibility with current system & computer capabilities, consult with users to identify current operating procedures & clarify program objectives, design & develop on operating system using ADW, COBOL & DB2, CICS, OS2, PC, MicroFOCUS & XDB & migrate it to IBM ES/9000 mainframe. Reqs: Bach in Comp Sci, Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv in ed & exp & 2 yrs exp in job offered or 2 yrs related exp as a Systems Analyst, Programmer Analyst or Consultant. Will accept 3 yrs college ed plus 3 yrs exp in job offered or in a related occup in lieu of req'd ed & exp. Must have some related exp, including each of the following: system design & development, development of data flow & entity relationship diagrams, database administration & using IBM 3090, COBOL II, DB2, CICS, OS2, MicroFOCUS ANIMATOR, XDB & ADW Knowledgeware CASE tool. $49,000/yr. 40 hrs/wk, 8a-5p. Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202 & include Ref # Employer Paid Ad

Consultant/Programmer-Analyst. 40 hrs./wk. 8 am-4 pm. $36,000/yr. overtime as needed compensated at $17.31/hr. Job requires: Bachelor's degree in Computer Engineering & six months experience in Job Offered or as a Systems Programmer or Computer Programmer. Job also reqs. 1) 6 mos. exp. using C computer language in a UNIX environment & 2) 2 college courses in control systems, 1 of which should be a laboratory class. Job duties: Design & add software for automotive control systems. Test electronic engine control modules to analyze performance. Perform real-time functional integration/system testing on designated software. Use C, C++ & Assembly computer languages on a DEC/VAX/VMS environment. Qualified applicants should send resume & verification of reqs. to 7310 Woodward, Rm. 415, Detroit, MI 48202. Ref #012-86. Employer Paid Ad.

Simulation Analyst: develop & analyze discrete event computer simulation models using Automod II s/w, C & C++, MC68000ECB; define required input data & scope of work to meet customer requirements; simulate mode production system & analyze system performance using Simon & Matlab; meet with customer to present results & address questions. Req. MS in computer sci/system eng; 6mon exp involving computer simulation using C, C++, MC68000ECB & Matlab; 1yr eng exp in industrial simulation. 40hr/wk, 8-5pm, $780/wk. Employer paid ad. Send resumes to 7310 Woodward Ave Rm 415, Detroit, MI 48202. Ref No. 188185.

Programmer Analyst to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to client needs, analyze, design, develop & implement computer software for clients EDP systems; analyze, design, enhance & customize manufacturing application package called CHESS developed in PRO-IV & SuperLayer; database modifications & and developed modules, administer production database data flow design, maintain CHESS application & provide technical support. Reqs: Bach in Comp Sci, Computer Engg, Computer Applications, Computer Information Systems or equiv in ed & exp. 2 yrs exp in job offered or 2 yrs related exp such as Systems Executive, Systems Analyst or Programmer. Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup. in lieu of req'd ed & exp. Related exp. must include designing & developing computer software using PRO-IV & SuperLayer on VAX machines with VMS O.S. & requires exp. in ORACLE 7.0. $41,610/yr. 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #186295 "Employer Paid Ad"

Company has an immediate opening for Senior Software Programmer. Successful applicants must use C language to design and develop computer applications for Employer's clients, who are users of electronic medical records systems. Consult with clients to determine user requirements. Maintain and upgrade medical records databased for Employer's clients and convert clients' medical records databases or SQL. Perform heavy coding under MS-DOS, Windows, SCO UNIX, SUN OS, AIX environments. Perform GUI and OOP development. Develop multi-platform applications. Conduct independent research and development to assist in Employer's continuing effort to expand applications for its clients. Position requires Master of Science degree, or higher, in Computer Science or Engineering. Monday through Friday 8a m to 5p m (40 hours per week). $38,000 per year. Successful applicants must be immediately eligible to accept employment in the United States. Interested persons should submit resume and work-related references to Missouri Division of Employment Security, 13131 Halls Ferry Road, P.O. Box 339, St. Louis, Missouri 63032. Attn: Mrs. Jimmie Gaston. Please refer to Job Order Number 321850.

Systems Analyst (Eng & Scientific Applications). 40hrs/wk, 8:30-5, $55,000/yr. Design/develop systems using PowerBuilder 4.0, ORACLE & WATCOM under LAN environment & MS Windows for the telecommunications industries. Design/develop ERD diagrams using CASE tools -Erwin & S-Designer. Develop/test/implement telephone related systems using PowerBuilder 4.0, ORACLE & WATCOM databases using OOP techniques. GUI design & development. Data modeling. Development of telephone switching & toll processing systems. Min reqs: BS in Computer Science, Physics or Math. 3 yrs in carrying out these duties set forth in the job offered or 3 yrs in relational database design & analysis & data modeling (to include therein 1½ yrs in GUI design & development using OOP techniques & in PowerBuilder application development & ½ yr in development of telephone related systems, & in using ORACLE, WATCOM & NOVELL). Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O.#TX7504252. Ad Paid by an Equal Opportunity Employer

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PROGRAMMER ANALYST (Ref 188595) to design, develop, program, implement & support cmpt based applications in customer sites, interface & develop specifications, correct sys errors as they occur, consult on future technology direction & platforms, create & execute programs/applications & sys level test plans to validate all new development, enhancements or corrections. Responsibilities include use of APS-COBOL, COBOL, IBM mainframe/MVS environment, JCL, DB2, CICS & PC based applications. Reqs: Bach in Comp Sci, Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its foreign ed equiv & 2 yrs exp in the job offered or 2 yrs related exp or a Programmer, Programmer Analyst, Systems Analyst, Software Engineer or Consultant. Must have some related exp which included systems programming, analysis & using each of the following: IBM mainframe, IBM PC, MVS, JCL, DB2, CICS & APS-COBOL. $47,652/yr. 40 hrs/wk, 8a-5p. Send resume to 7310 Woodward Ave., Rm 415, Detroit, MI 48202 & include Ref & Employer-Paid Ad

SOFTWARE ENGINEER required. Perform logical & physical database design, database modeling & applications software development using ESQL/C, C++, Object Oriented Design Methodologies & Shell Scripts on AIX/UNIX platforms. Perform functions of Database Administrator (tuning, testing & troubleshooting) on the INFORMIX Online Database Engine & participate in full life-cycle-systems design/development using IEF, REFORM & SAS. Master's Degree or its equivalent required in Computer Intensive Curriculum, plus 1 year experience in the job duties described above. University work experiences (other than mere classroom study) may be used to satisfy the experience requirements. Must have proof of legal authority to work in the U.S. Salary $50,000/year for a 40 hour work week. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778-0001. JO Number TX7502983. Ad paid by an Equal Opportunity Employer

S/w Eng: develop MC68HC11K4/E9 based BCM s/w using Avocet 68HC11 Assembly; analyze h/w design of RF wireless communication device, simulate ASIC circuitry performance using PSPICE & ORCAD; use Nohau EMUL68-PC Emulator, POD-11KE, EMS & DRBS under VAX as a development system to debug & and BCM s/w & h/w communicate with network using J1850, CCD & TIRIS protocols; perform s/w designing, coding & testing for vehicle subsystems; design 68HC05 based system interfaced with PC to control servo motor position. Req. MS in computer/electrical eng; 1yr exp as auto electronics engineer involving development of 68HC05 based controller sys, design of s/w for vehicle subsys; 1yr exp in use of 68HC11. 40hr/wk, 8-5pm, $25/hr. Employer paid ad. Send resumes to 7310 Woodward Ave Rm 415, Detroit, MI 48202. Ref No. 00586.

SOFTWARE ENGINEER required. Design, develop & implement GUI's using C++, SQL, X-Windows & Visual Basic on UNIX/C & Windows platforms. Develop & optimize system simulation models using mathematical programming, sequencing & scheduling algorithms & Stochastic processes. Design data acquisition software using experience with RDBMS & perform statistical analysis using SAS. Masters Degree or its equivalent required in Math, Computers or Engineering, plus 1 year experience in the job duties described above. University level project work may be used to satisfy the experience requirements. Must have proof of legal authority to work in the U.S. Salary $38,000/year for a 40 hour work week. Apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778-0001. J.O. Number TX7505230. Ad paid by an Equal Opportunity Employer

S/w develop engineer: develop engine control s/w including implementation & verification of s/w updates for SBEC III controller used in Chrysler large or small vehicles & mini vans; design & develop s/w updates consisting prototype s/w features using assembly language for Motorola 68HC16 microprocessor; supply prototype engine control s/w written in languages of Motorola 68HC16/68HC11 for Jeep/Truck, provide control s/w of Motorola 68332 in C++ for Chrysler's next generation engine/transmission controller. Req MS in computer sci/eng, 2yr exp as electrical eng involving in design of real time embedded control sys & programming for Motorola MC68HC05, MC68HC11. 40hr/wk 8-5pm, $20.64/hr. Employer paid ad. Send resumes to 7310 Woodward Ave Rm 415 Detroit MI 48202. Ref No. 194095

SENIOR SOFTWARE ENGINEER required. Design & analysis of Fare Quote & Pricing Software for both International & Domestic Airline Industry using IMS DB/DC, Assembler coding and TPF. Review function requirements, identify reusable code, write detailed DESIGNS & provide assistance to developers. Establish sub-systems & fall-back plans & develop test tools to monitor system performance. Bachelor's Degree or its equivalent required in Math, Computers or Engineering, plus 4 years experience in the job duties described above. Must have proof of legal authority to work in the U.S. Salary $55,000/year for a 40 hour work week. Apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778-0001. J.O. Number TX7505228. Ad paid by an Equal Opportunity Employer

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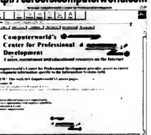

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Research and Development Specialist. Will develop custom software for both laboratory information management systems and data acquisition and reduction systems to be used for purposes of chemical analyses to solve engineering type problems and perform development work in the areas of analytical chemistry and diesel emissions analyses. Will perform test and analysis of chemical process and make recommendations regarding adequacy of products, components, processes, test methods and laboratory software for analytical chemistry and diesel emissions analyses. Will use various computer systems and develop appropriate software in conjunction with ORACLE database management system. Will perform chemical analyses by classic and instrumental methods including use of IR, gas Chromatograph, GC/MS, HPLC, high pressure liquid Chromatograph, and ion Chromatograph. Requires Master's degree in Computer Science. Also requires six months experience in the job to be performed or six months experience as a Programmer. If experience in related field, entire experience must include programming in either ORACLE or INFORMIX relational database system. Education to include completion of courses in which the following methods were used: IR, gas Chromatograph, GC/MS, HPLC, high pressure liquid Chromatograph, and ion Chromatograph. Hours 8:00 a.m. - 5:00 p.m. 40 hours per week at $35,984 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send two copies of resume to Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605, ATTN: Dennis Jones, Ref #V-IL 13752-D. No Calls. An Employer Paid Ad.

ENGINEER SOFTWARE. Create instrumented build of graphics product; debug C++ & C source code; upgrade functionality of C++ code; port RDBMS products to various platforms; write programs for testing network & database products, sys. testing & QA; define & apply config. mgmnt & version control procedures; provide training on porting to OEM's & worldwide porting labs; participate in code enhancement designs for prfmnc ports; design & test test suites for database servers & tools. BS or foreign equiv in CS, Comp. Eng., EE or Electronics plus 1 yr in job offd or as a S/W Eng., Comp. Consultant, Programmer Analyst or Jr Eng. reqd. Exp w/designing, dev & debugging C & C++ programs, UNIX, UNIX internals & UNIX dev utilities the make, yacc, lex, edb, adb, awk, sed, SCCS, prol shell prgmng; ADA, FORTRAN, COBOL, ORACLE DBMS, forms & SQL. Courses, projects or exp. in X Windows & Motif GUI envrnmnts, dev client/server programs using TCP/IP, OSI, OSF DCE threads, Sockets. reqd. $3166.67/mo. 40 hr/wk. Job site/intv: Lenexa, KS. Please apply with a resume in person to your local Kansas Job Service or send resume to: Dept. of Human Resources KS797771, Attn: Don Bruner, 401 SW Topeka Blvd, Topeka, KS 66603-3182. Applicants must have proof of legal authority to work in the United States.

CUSTOMER SUPPORT ENGINEER (4 positions) Install hardware and software systems for the healthcare industry, particularly software used by cardiologists to locate arrhythmias, train physicians and medical personnel using the system, may assist physician and his staff using the system as they perform medical procedures on patients, provide follow-up training and demonstration of new features, attend foreign and domestic tradeshows, provide telephone and on-site support to users, prepare written reports and recommendations to management as required. 40 hrs/wk. $2,500 - $2,900 per month (Salary commensurate with experience.) Requires Bachelor or equivalent in Biomedical or Electrical Engineering. In lieu of Bachelor degree will accept a Masters Degree in Biomedical Engineering. Must have taken any biomedical classes, must be fluent in ONE of the following languages: French, German, Spanish, Hindi, or Japanese. Extensive domestic travel (up to 75%) and some international travel (15%). Apply at the Texas Employment Commission, Houston, Texas or send resume to Texas Employment Commission, 1117 Trinity, Room 424T, Austin, Texas 78778, J.O. #TX7504254. Ad paid for by An Equal Employment Opportunity Employer.

TITLE: Senior Systems Analyst - Information Engineering Facility (I.E.F.) Systems Developer. DUTIES: Analyzes user requirements, procedures, and problems to automate processing or to improve existing computer systems. Confers with personnel of organizational units involved to analyze current operational procedures, identify problems, and learn specific input and output requirements, such as forms of data input, how data is to be summarized, and formats for reports. Utilizes the I.E.F. to write detailed description of user needs, program, functions, and steps required to develop or modify computer programs. Review computer system capabilities, workflow and scheduling limitations to determine if requested program or program change is possible within existing system. Studies existing information processing systems to evaluate effectiveness and develops new systems to improve production or workflow as required. Utilizes the I.E.F. prepare workflow charts and diagrams to specify in detail operations to be performed by equipment and computer programs and operations to be performed by personnel in system. Utilizes the I.E.F. to develop new information systems to meet current and projected needs. Plans and prepares technical reports, memoranda, and instructional manuals as documentation of program development. Utilizes the I.E.F. to upgrade system and correct errors to maintain system after implementation. Performs business area analysis, business systems design, program construction and implementation using the I.E.F. Resolves issues and guides junior team members. MINIMUM REQUIREMENTS: Bachelor of science degree in computer science, computer engineering, electrical engineering, mathematics or other area of major concentration appropriate to the position (or training and experience equivalent to such degree). Prior Experience: Four years prior experience in position(s) providing computer service(s) to either a child support enforcement agency, or a social service agency, or a government agency, in computer software development which include the following responsibilities: - Use of the information engineering methodology (I.E.M.) in a multi-entity environment to develop an information engineering facility (I.E.F.) project. - Use of Cobol, CICS, DB2, TSO/ISPF, JCL, QMF, SQL, OS/2, DB2/2, I.E.F. 5.2, C (computer) language and - Use of IBM mainframe computer. STARTING SALARY: $70,000.00 per year for a forty-hour week. CONTACT: THIS JOB ORDER NUMBER FOR THIS JOB OPPORTUNITY IS KS5606537. PLEASE APPLY IN PERSON OR SUBMIT A RESUME REFERRING TO JOB ORDER NUMBER KS5606537 TO: Mr. Dan W. Bruner, AEC Coordinator for Job Service Administration Unit, Kansas Department of Human Resources, 401 S.W. Topeka Boulevard, Topeka, Kansas 66603-3182. NOTE: MUST HAVE PROOF OF LEGAL AUTHORITY TO WORK IN THE UNITED STATES. AD PAID FOR BY EMPLOYER.

Systems Analyst for database (Oracle)/networking projects; configure & size databases/networks & test new features provided in update; analyze system & provide recommendation for downsizing system/application from mainframe to midrange systems; provide expertise in tools such as SQL*NET, distributed databases, TCP/IP, SNA, Windows NT; provide expertise for porting data from 1 platform to another or 1 database to another; migrate database to review newer version & test data integrity & connectivity aspects; work on new front-end tools like PowerBuilder & Uniface; explore Window NT & other windows related application tools; work on HP9000, RS6000, SunSparc, OS/Based PC's, Novell Netware based PC's. Reqs. Bach. in Comp. Sci. or equiv. in foreign education. 6 mos exp in job offered or 6 mos related exp such as Support Group Leader. Related exp must include administering LAN & using ORACLE, PowerBuilder & Uniface. $42,000/yr. 40 hrs/wk 8a-5p. Must have proof of legal authority to work permanently in U.S. Send 2 resumes to Illinois Dept. Of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605, Attn: Dennis Jones, Ref #V-IL 13687-D (No calls). Employer Paid Ad.

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UNIX/OS/2, INTERNALS
UNIX/SMK, Adm/Dev
MAC APPS, CC MAIL
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DB2 DBA, JAM/JYACC
VAX/VMS/RDB

Mainframe
DB2/CICS, MF Cobol
IMS DB/DC, IDMS/Adm
AS400 Synon/JD Edwds
Adabas Natural, SAS
Batch Cobol/VSAM

System Engineer: design & develop real data visual conference s/w product in Windows 3.1 & Windows 95 environments. Responsible for GUI design & development using Borland C++ 3.1 & Borland C++4.5 or up & OWL 2.0 & API, communication software design & development using IBM Lakes API, CLI & RLI (Toolkit) 1.0 for Windows, perform object oriented analysis and design method. Req. MS in computer eng. 6mon exp in using Borland C++3.1 & GUI, 1.5yr as s/w eng. related to design & development of s/w for real-time data acquisition. 40hr/wk, 8-5pm, $846/wk. Employer paid ad. Send resumes to 7310 Woodward Ave. Rm. 415, Detroit, MI 48202. Ref No. 190685

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Software Design Engineer - software development of new subsystems and new products as well as support of existing products for international markets, prepare and/or update documentation used within the engineering department and documentation used by the final test department, software development and maintenance including coding, testing, and integration, functional and software specification in concert with the Chief Engineer, technical documentation and pilot site implementation, proposal writing, design specifications and time estimates; specific software duties include development of real time systems (including a co-compilation system), assembler interrupt handling routines, and development of hardware driver software, debugging on in-circuit emulators, work with PC/MS-DOS, ROM-based target systems, develop high-level data structures, use real time executives including VRTX, MTOS, SMX, iRMX and/or develop equivalents; use of MC68000 FAMILY, CCITT TUP and CCITT ISUP digital signaling modes and the following analog and digital signaling types: discontinuous E&M interface and discontinuous CEPT interface. 4 years college, B.S. degree of Electronic Engineering required. 2 years experience in the position or 4 years as System Programmer required. Experience in related position must include use of E1 trunkline, iRMX real time executive, use of MC68000 FAMILY, debugging on in-circuit emulators, use of CCITT-TUP and CCITT-ISUP digital signaling modes, and the following analog and digital signaling types: discontinuous E&M interface and discontinuous CEPT interface. 40 hrs./wk., 8:30 a.m. - 5:00 p.m. $42,000/year. Must have proof of legal authority to work permanently to work in the U.S. Send 2 copies of resume to Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention: Ruth Daniels, Reference Number V-IL-13922-R. NO CALLS. AN EMPLOYER PAID AD.

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Programmer Analyst, Pompano Beach, FL and other client locations. Analyze, develop, design and maintain modules for computer software applications. Tune databases, test, implement and maintain programs, estimate program development and cost. Reqd., Bachelor's degree in Comp. Sc. or Engg. 3 mths training in Power builder & Sybase and 2 yrs. exp in the job duties or as a systems analyst or software engineer. Experience is to include at least one year in the design and development of business applications using CICS, DB2, IMS db, VSAM, JCL, VS COBOL II, MVS/ESA, MVS/XA, INTERTEST, XPEDITER. The experience may be concurrent. Sybase, Powerbuilder training may be substituted by equivalent experience. Training may be concurrent. M-F 8:00 a.m. - 5:00 p.m. 40 hrs./wk. $45,000/-per yr. Send resume to Job Service of Florida, 2880 W. Oakland Park Boulevard, Fort Lauderdale, FL 33311-1347. Re: Job Order Number FL-1348843.

PROGRAMMER ANALYST. Performing feasibility studies, EDP requirement analysis, review, evaluate and suggest modifications to client requests, design, develop, define programs and systems, writes detailed operating procedures, database design and system flow-charts, prepare and plans and test data; programming, testing and documentation; assist the users in migrating to new application. The above applications will be performed using IBM mainframes and to utilize particularly MVS, DB2, CICS, COBOL and IEF CASE tool for analysis, design and development. Bachelor's degree in Computer Science or Math-related and 2 years experience (to include with IEF CASE TOOL) required. Must be able to travel. $46,000/year. Applicants apply in person or by resume to Georgia Department of Labor, Job Order #GA5930570, 465 Big Shanty Road, Marietta, Georgia 30066-3303 or the nearest Department of Labor Field Service Office.

Software Engineer, Pompano Beach, FL and other client locations. Analyze, design, develop, modify, enhance and implement customized business applications, prepare business system documents, process flow diagrams, data flow diagrams and detailed design documents, design hierarchical and relational databases, prepare, test plan and decide test strategy. Identify data structures and algorithms for program implementation. Reqd., Masters degree in Math or Comp. Sc. or Comp. Sc. Engg. and 2 yrs. exp. in the job duties or 2 yrs. as a systems analyst or programmer analyst. Exp. is to include at least 2 yrs. in MVS/XA, MVS/ESA, CICS, DB2, IMS, VSAM, JCL, ISPF/PDF, TSO/E, COBOL/VS, COBOL II, Assembler H, Intertest, Expediter, MF COBOL, MF CICS, XDB, File-Aid, ADW (Application Development Workbench) and ADG (Analysis, Design and Generation workstation). The experience may be concurrent. M-F 8:00 a.m. - 5:00 p.m. 40 hrs/wk. $52,000/-per yr. Send resume to Job Service of Florida, 2880 W. Oakland Park Boulevard, Fort Lauderdale, FL 33311-1347. Re: Job Order Number FL-1348164.

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System Analyst. Analyzes user requirements, procedures, and problems to automate processing or to improve existing computer systems. Requirements: Bachelor's degree in computer science, engineering, or math-related and two years experience in job offered or in design and development of customized software, to include experience with Oracle, SQL, X-Windows, TCP/IP, Motif or Unix machines. Must be able to travel. Salary: $38,000/year. Applicants apply in person or by resume to: Georgia Department of Labor, Job Order #GA 5929274, 2943 N. Druid Hills Road, Atlanta, Georgia 30329-3909 or nearest Department of Labor Field Service Office.

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SYSTEMS ANALYST. Analyzes user requirements, procedures and problems to automate processing and to improve existing computer application software systems. Depending upon requirements at different times may supervise 4-5 programmer analysts developing software using UNIX, C, C++, INFORMIX, X-WINDOWS/OPEN LOOK. $45,000/year. Will be working at various unanticipated locations throughout the United States. Bachelor's degree in Computer Science and two years' experience required. Interested applicants apply by resume or in person to Georgia Department of Labor, Job Order #GA5831720, 2972 Ash-Kay Drive, Smyrna, Georgia 30082-2369 or the nearest Department of Labor Field Service Office.

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Point-of-Sale Specialist
Assist in development and support of point-of-sale systems. Requires knowledge of Fujitsu Atrium POS hardware and software. General PC hardware, operating systems and PC LAN experience preferred. **Code: CS-POSS**

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Develop new systems, enhance existing ones, and participate in future client/server initiatives. Experience with Visual Basic, MS Access, MS SQL server necessary; Oracle and PowerBuilder a plus. **Code: CS-C/S**

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Requires 3-4 years' experience in a multi-CPU environment. Requires technical knowledge of AS/400 and RS/6000 operations. **Code: CS-CO**

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Strong customer focus and 3+ years' experience supporting a large Window for Workgroups, Microsoft applications, and TCP/IP environment. Experience with PC networking environments and the ability to troubleshoot and diagnose hardware and software problems. **Code: CS-PCS**

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Regional Scope: Southern California

CASTING CALL: top technologists!

IS job opportunities are at the forefront of Southern California's economic recovery

By Leslie Goff

Driven by a surge of small technology-oriented companies, Southern California's economy has begun to stabilize and recover from the recession of the early 1990s. Overall economic growth is slow, but information systems professionals can be more optimistic about the employment market than people in many fields.

"We have a broad-based economic rebound going on in Southern California," says Jack Kyser, chief economist at the Economic Development Corporation of Los Angeles County. "The major sectors driving it are all major users of technology."

But finding the right IS professionals to fill the bill has been a struggle for Alan Alters, director of information technology/West Coast at Turner Broadcasting Worldwide Information Technology Services in Los Angeles. Alters oversees a staff of 20, which he plans to increase by 20% to 25% this year.

"I have openings, and I'm just not finding the types of qualified candidates I'm looking for," Alters says. "We're getting into client/server applications support. We really need some high-performance talent. But I just don't see the level of skill I've been accustomed to."

Job opportunities are on the rise in Los Angeles, especially for IS professionals

A major labor migration out of the region, following massive layoffs and company closings during the recession, has contributed to that gap.

Alters says several of his top-rate colleagues traded IS jobs for other careers just to stay in the area. Population growth in Nevada, Arizona and New Mexico has been largely attributed to Californians moving east for new jobs, lower housing costs and other quality-of-life issues.

"That was precipitated by what was going on in the local economy," Kyser says. "But aggressive economic development efforts here are helping new technology-oriented industries grow."

Los Angeles County

Los Angeles would be the ninth-largest state in the country if it weren't a city. But Kyser says, "We're more of an *Inc.* 500 town than a *Fortune* 500 town." *Inc.*'s list is based not on sales volume and revenue but on growth ratios, "and we have a lot of small, quickly growing companies," he says.

And Los Angeles needs them. Kyser estimates that among the three counties, 74% of the jobs that were lost to the recession were in Los Angeles County. Today, the county is regrouping. International trade, management consulting, professional services and new entertainment-industry concerns all are on the rise in Los Angeles. And the old standbys — tourism, television and motion picture productioo — continue to provide an economic anchor for the area.

Orange County

The New York Times reported on Dec. 5 that Orange County, which declared bankruptcy in late 1994, "is stumbling through a fiscal recovery." The article said the county "has settled into a comfort zone that many … say is part denial, part business as usual and part pushing the costs of the crisis" onto the poor.

The county's comfort zone features a diverse mix of companies and falling unemployment rates, but Kyser notes that Orange County traditionally has had the highest employment rates of the three counties.

San Diego County

Public-sector jobs dominate in San Diego, but "if you're in San Diego and you're not in the public sector, you're probably working at a high-tech company doing software development," says Max Schetter, director of economic research at the Greater San Diego Chamber of Commerce.

Of the five largest private-sector companies in the area, three are in the health care field: Scripps Institution of Medicine and Science, Sharp HealthCare Corp. and Kaiser Permanente Health Plan, Inc. San Diego Gas & Electric Co. and defense contractor Science Application International Corp. round out the list. Schetter says, however, that smaller, entrepreneurial firms are driving the area's recovery.

After rapid growth in the 1980s, San Diego County fell hard under the pressures of the recession, losing thousands of jobs in defense and aerospace. But new jobs are emerging in four categories: nondefense high-technology, including software development, telecommunications and biotechnology; tourism; international trade; and professional services. "In general the outlook is good for IS folks," Schetter says. "There's a good demand for highly skilled workers, but without top skills, it's a very competitive market." ■

Goff is a freelance writer in New York.

THE INSIDE TRACK

Alan Alters, director of information technology/West Coast at Turner Broadcasting Worldwide Information Technology Services, has the following advice for IS staffers headed for the sunny shores of Southern California:

"If you're thinking of moving out here, try to get a referral to a really good recruiting firm. There are a lot of paper mills in this market, but if you are really good, finding a recruiter with the right connections can really open doors for you out here.

"What's really lacking in this market are people skills. I use recruiters to help me find someone who has followed a project through to completion." — *Leslie Goff*

ORANGE COUNTY

Top 10 Employers

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University of California, Irvine
Hughes Aircraft, Fullerton
McDonnell Douglas, Huntington Beach
Kraftis Berry Farm, Buena Park
Santa Ana Unified School District, Santa Ana
Rockwell International, Anaheim
United Parcel Service, Anaheim
Food 4 Less Supermarkets, La Habra
UCI Medical Center, Orange

Economic Picture

Total labor force: 1,350,000
Unemployment rate (Oct. 1994): 6.0%
Unemployment rate (Oct. 1995): 5.1%
Median home price: $211,300

SAN DIEGO COUNTY

Top 10 Employers
(all are in the city of San Diego)

U.S. Navy
State of California
U.S. government
County of San Diego
University of California
City of San Diego
Scripps Institution of Medicine and Science
San Diego State University
Sharp HealthCare
U.S. Postal Service

Economic Picture

Total labor force: 1,240,000
Unemployment rate (Oct. 1994): 7.5%
Unemployment rate (Oct. 1995): 6.6%
Median home price: $204,000

LOS ANGELES COUNTY

Top 10 Employers
(all are in the city of Los Angeles)

Los Angeles County
U.S. government
Los Angeles Unified School District
City of Los Angeles
Kaiser Permanente Health Plan
Hughes Aircraft
Bank of America
Northrop Grumman
Rockwell International
American Stores

Economic Picture

Total labor force: 4,453,000
Unemployment rate (Oct. 1994): 7.8%
Unemployment rate (Oct. 1995): 7.5%
Median home price: $186,000

Sources: Economic Development Corp. of Los Angeles and Greater San Diego Chamber of Commerce

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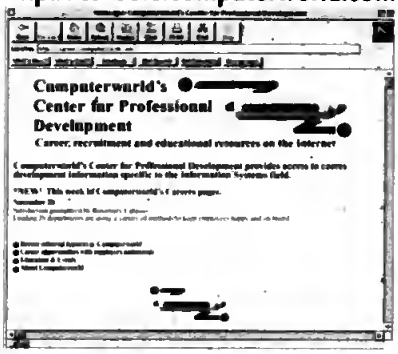

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- Visual Basic & C++
- DataWarehousing

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- Visual Basic & C++
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SunAmerica offers an excellent compensation and benefits package. Qualified applicants are invited to call (310) 772-6408 or forward your resume to. **SunAmerica, Inc., Professional Recruitment, 1 SunAmerica Center, Los Angeles, CA 90067-6022. FAX: (310)772-6361.** Equal Opportunity Employer

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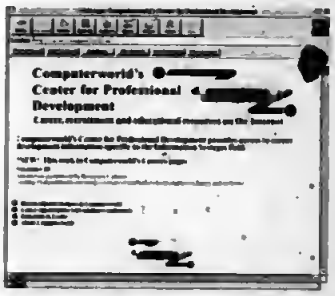

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- DEC/VAX, MUMPS

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- Tandem (supervisory position)
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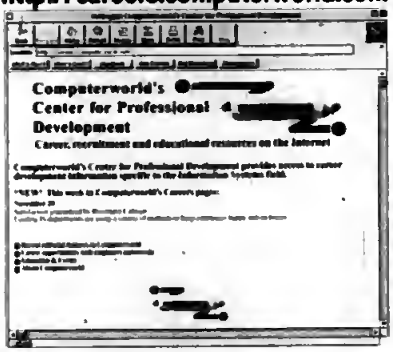

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Senior Business Analyst

Requires Bachelor's degree in Computer Science, Business, or equivalent experience. 5 years' experience in training, consulting, analysis or applications development is required, as is planning, organizing, directing and controlling application development projects. Managing business requirement analyses with clients and coordinating the development of efficient/effective applications solutions is essential.

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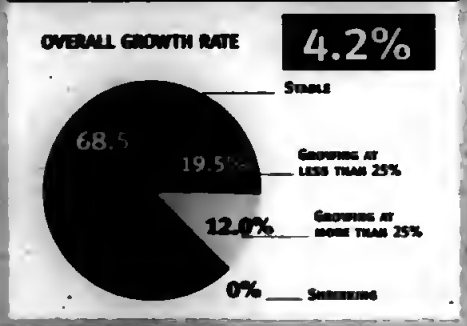

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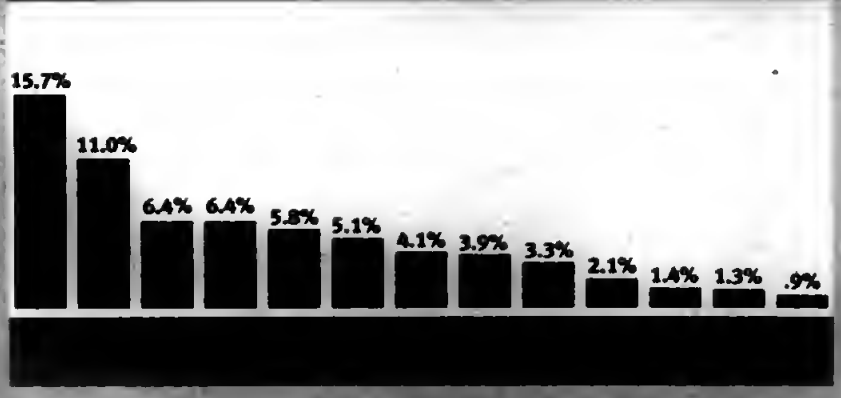

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Fax software grows up

New features turn faxing into a group application

By Lynn Haber

Software that allows users to send and receive faxes from their desktop PCs isn't new to the market. But the technology is maturing, and the benefits are easier to find, particularly for multiuser packages.

Look at Eastman Kodak Co. The Rochester, N.Y.-based company recently integrated an automated fax package with an outbound order confirmation application. Used by several hundred users to fax some 800 documents a day, the application provided immediate benefits, said Lynn Kinsman, a systems analyst at Kodak.

"Our customers love it because it enables us to respond to orders immediately so they know that they'll be getting the right materials," she says.

Prior to the automated fax package, orders were received via a stand-alone fax machine. Customer service representatives dealt with pieces of paper, sometimes scribbling notes and rarely being able to confirm receipt of an order with the customer. "We wouldn't know until the customer received the order if it was correct or not," Kinsman says.

Control over the work process is a key benefit of integrating fax capability with a specific application. "When the process is paper-based, you can't control it," Kinsman notes.

Kodak is among the companies interested in automated faxing for its cost savings. By sending and receiving faxes from their PCs, users eliminate the time it takes to print out a document, walk to the fax machine and manually send it.

Organizations have been slow to adopt automated faxing. "It's difficult to get automated fax projects going because most organizations have no idea what they spend on fax," says Andrew Rollason, a research analyst at Gartner Group, Inc. in Stamford, Conn. "Not only do organizations tend not to have a handle on fax costs, but they have no idea who is sending faxes or what departments are involved."

Features drive appeal

Today, greater functionality has helped broaden the appeal of both LAN and enterprise fax products. Vendors have added management features and electronic-mail integration.

Departmental or LAN-based fax packages may serve a few dozen or several thousand users. Most use the software to send rather than receive faxes.

One complaint about department-level servers is that many are based on DOS and have problems recovering from system crashes. But the market now is shifting to Windows NT-based servers.

"This is a great direction for departmeotal fax because NT servers are designed as servers and as such are easily brought up if the system should crash," says Pete Davidson, president of Davidson Consulting in Burbank, Calif. He says product differentiation in the NT marketplace tends to be based on having good front-end software, good vendor support for E-mail integration and inbound routing and network management features, or tools.

Players in the corporate fax market that offer departmental and enterprise products include Alcom Corp. in Mountain View, Calif.; Cheyenne Software, Inc. in Roslyn Heights, N.Y.; Optus Software, Inc. in Somerset, N.J.; and RightFax Corp. in Tucson, Ariz.

Cheri Hilderbrand, director of marketing at RightFax, reports that many businesses are centralizing their fax operations by installing a fax server at headquarters. A centralized fax system, she says, gives organizations platform and client compatibility, and, in a true client/server environment, allows conversion and rasterization to take place at the file server. That leaves the workstation free to do other tasks. Fax servers also let users broadcast fax messages.

An enterprise fax system is a larger initiative, involving tens of thousands of users across the enterprise, which can be global, according to Rollason. "It requires more standards, and its advantages include being able to tie together fax servers, which allows organizations to take advantage of least-cost routing," he says.

Trends in corporate fax systems, industry participants say, include unified messaging, or the ability to pick up both fax and E-mail messages in a single connection. In the coming year, voice mail will be added to the mix. ■

Haber is a freelance writer in Norwell, Mass.

Thinking about fax

- **Automated fax is more effective for specific applications than for use as a general-purpose tool. Someone will have to be in charge; training is required.**
- **Serious shoppers for large installations or for a distributed installation will want to look for an NT or Unix-based fax product.**
- **Organizations will need to understand their internal fax costs before they can cost-justify a fax server.**

Features such as the speed buttons in 01 Communique's 01/fax have made multiuser fax systems more appealing

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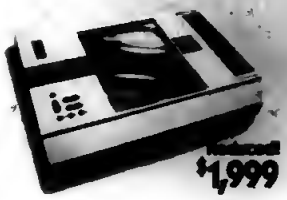

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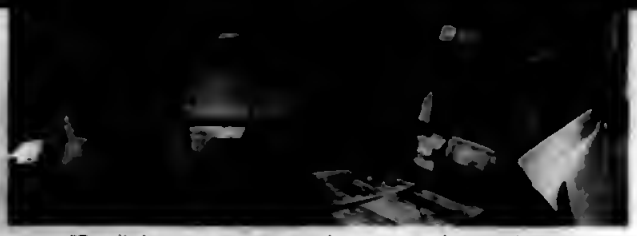

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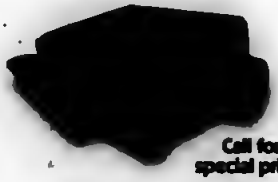

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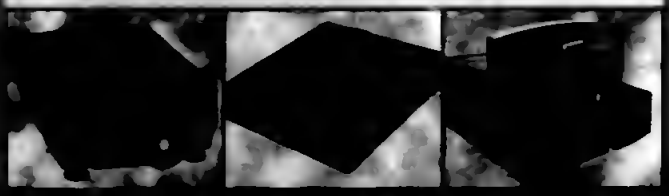

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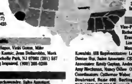

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Jan 5 Stock Ticker

Gainers / Losers

Percent

Gainers		Losers	
QMS Inc.	38.2	FTP Software Inc.	-57.6
Printronix Inc.	23.5	Adobe Systems Inc.	-33.0
Computer Network Tech.	22.2	Telebit Corp.	-32.7
Magic Software Enterprises	22.0	NetManage Inc.	-31.0
Gupta (L)	17.1	MapInfo Corp.	-30.0
Retix	15.4	Symantec Corp.	-25.7
Advanced Logic Research	12.8	Progress Software Corp.	-22.5
Radius Inc. (L)	12.5	Manugistics Group Inc.	-21.7

Dollar

Gainers		Losers	
Printronix Inc.	3.38	Adobe Systems Inc.	-20.50
Bell Atlantic Corp. (H)	2.63	FTP Software Inc.	-16.50
Komag Inc.	2.50	Ascend Communications (H)	-12.50
AT&T (H)	2.25	Spyglass Inc.	-12.00
America On-Line	2.00	Sterling Software Inc. (H)	-8.88
GTE Corp. (H)	1.75	Intuit Inc.	-8.75
Magic Software Enterprises	1.63	Progress Software Corp.	-8.50
QMS Inc.	1.63	US Robotics	-8.13

[redacted]

Great expectations in 1996

In 1995, Wall Street rewrote Charles Dickens' opening line in *A Tale of Two Cities*: It was the best of times, and it was *really* the best of times.

Computerworld spoke with several market analysts and asked them to look ahead in 1996 and pontificate on which technology stocks and companies they had great expectations for in the new year. As might be expected, companies that have something to do with the Internet were popular choices.

Richard Chu, an analyst at Cowen & Co. in Boston, cited **Digital Equipment Corp. (DEC)**. "The progress of Digital's FX32 bindary translation technology for the Alpha chip will be interesting to follow in 1996. It could turn out to be a potent weapon or relatively harmless," he said.

Analyst predictions

Nate Zelnick, editor of "Internet Business Report" in New York, said he is looking beyond the overhyped Internet stocks. He pointed to **Intel Corp. (INTC)** as "a very good, undervalued Internet stock for 1996." Zelnick said he will search for companies that can solve "network hardware and scaling issues that will affect the Internet in 1996." He said **Cascade Communications Corp. (CSCC)** fits the bill.

Continuing in the same vein, Jim Wade, an analyst at Alex. Brown & Sons in Baltimore, said **Cisco Systems, Inc. (CSCO)** and **Bay Networks, Inc. (BNET)** could help with the Internet's need for increased capacity. He also said **Security Dynamics Technology (SDTI)** and **Network General Corp. (NETG)**, for network security and management respectively, should have a solid year.

Adam Schoenfeld, an analyst at Jupiter Communications, Inc. in New York, added other Internet-related names to the list. He said **Microsoft Corp. (MSFT)** "hasn't been given the respect it deserves as an Internet player." Schoenfeld also mentioned **PSINet, Inc. (PSIX)**, "a solid and steady Internet access provider," and **Checkfree Corp. (CKFR)**, a company involved in on-line commerce and at-home bill-paying and banking. He said each is poised to have an interesting year.

Al Goldman, an analyst at A. G. Edwards in St. Louis, stepped outside the Internet and offered up **Sybase, Inc. (SYBS)** and **Applied Materials, Inc. (AMAT)** to the "potentially interesting" list. He also liked **Compaq Computer Corp. (CPQ)**.

Mike Murphy, editor of "California Technology Stock Letter" in Half Moon Bay, Calif., said **Apple Computer, Inc. (AAPL)** will be interesting to follow this year because of Pippin, its multimedia development platform. He also said **Informix Corp. (IFMX)** and **AT&T (T)**, with its entrance into the Internet access market, will be fun to watch.

Only a Dickens ghost could tell us if we'll look back at this list and echo Scrooge's "Humbug," or paraphrase Tiny Tim and bless them, every one. — *Stewart Deck*

Exch	52-Week Range		Company	Jan. 5 Close	Wk Net Change	Wk Pct Change
[illegible]						
COMS	53.63	22.25	3COM Corp.	44.25	-1.63	-3.5
AIT	50.63	39.88	Ameritech Corp. (H)	50.50	-0.25	-0.4
APTS	15.00	6.00	Apertus Tech.	6.00	1.63	-75.3
T	58.88	47.63	AT&T (H)	50.88	2.25	3.3
ASND	87.25	9.88	Ascend Communications (H)	68.13	-13.50	-15.5
BNYN	19.30	6.00	Banyan Systems Inc.	10.50	0.38	3.7
BNET	50.00	18.38	Bay Networks Inc.	39.00	-2.00	-4.9
BEL	68.88	48.38	Bell Atlantic Corp. (H)	69.75	2.63	3.9
BLS	45.00	26.88	BellSouth Corp. (H)	44.13	0.63	1.4
BBN	48.75	14.63	Bolt, Beranek & Newman	37.13	3.88	-9.5
BRKT	32.00	10.50	Brooktrout Technology	27.50	1.00	3.5
CS	87.75	37.38	Cabletron Systems	77.50	-2.63	-3.3
CSCC	92.50	30.63	Cascade Communications	77.63	7.38	8.7
CGRM	25.13	12.25	Centigram Communications	18.00	-1.50	-7.7
CSCO	89.38	32.38	Cisco Systems Inc.	70.75	-4.38	-5.8
CLIX	13.38	6.00	Compression Labs Inc.	6.75	0.50	8.0
CMNT	12.75	6.00	Computer Network Tech.	5.50	1.00	22.2
XCOM	14.50	9.00	CrossComm	10.38	-0.88	-7.8
DIGI	64.00	30.13	DSC Communications	31.25	-5.88	-15.8
FORE	67.75	35.50	FORE Systems Inc.	54.25	-4.25	-7.3
GDC	35.88	9.25	General Datacomm Inds.	14.75	3.50	-14.5
GSX	42.50	30.00	General Signal Networks	33.63	1.25	3.9
GTE	45.25	30.00	GTE Corp. (H)	45.00	1.75	4.0
MCIC	27.50	17.38	MCI Communications Corp.	25.88	-0.13	-0.5
MICM	12.50	5.50	MICOM Communications Corp.	7.25	0.00	0.0
MNPI	58.00	9.00	Microcom Inc.	25.13	-0.50	-2.0
NETM	34.00	11.00	NetManage Inc.	15.88	-7.13	-31.0
NTSQ	10.50	3.63	Netrix Corp.	5.00	0.50	11.1
NCDI	17.00	3.88	Network Computing Devices	7.44	0.75	3.5
NWK	42.00	19.75	Network Equipment Tech.	25.50	-3.88	-14.2
NETG	46.80	22.25	Network General	35.38	-1.50	-4.6
NWTH	42.19	7.38	Net Worth Inc.	42.13	0.00	0.0
NN	45.38	25.00	Newbridge Networks Corp.	42.13	0.63	1.5
NT	44.75	31.50	Northern Telecom Ltd. (H)	42.50	-0.25	-0.6
NOVL	23.25	13.75	Novell Inc.	15.00	0.88	6.2
NYN	54.00	35.88	Nynex Corp. (H)	53.50	0.50	0.9
OCTL	42.63	18.00	Octel Communications Corp.	31.13	-1.75	-3.9
ODSI	43.25	12.75	Optical Data Systems Inc.	21.00	-4.25	-16.8
PCTL	43.88	11.13	PictureTel Corp. (H)	38.75	-4.25	-9.9
PTON	10.75	5.13	Proteon Inc.	6.50	-0.13	-1.9
RACO	7.88	3.13	Racotek Inc.	5.25	0.13	2.4
RETX	5.50	1.81	Retix	2.31	0.31	15.6
SFA	24.88	11.50	Scientific Atlanta Inc.	14.00	-0.88	-5.9
SHVA	77.50	27.00	Shiva Corp.	72.25	-0.25	-0.3
SBC	59.75	38.63	Southwestern Bell Corp. (H)	58.88	1.50	2.6
FON	41.13	25.88	Sprint Corp.	40.50	0.88	2.2
SMSC	31.63	12.50	Standard Microsystems Corp.	36.50	0.00	0.0
STRM	42.00	30.00	Stratacom Inc.	58.44	-6.81	-9.3
TBIT	8.63	2.38	Telebit Corp.	4.13	-2.50	-32.7
USRX	110.50	50.63	US Robotics	80.88	-8.13	-9.3
USW	46.38	30.50	US West Inc.	39.25	-0.38	-1.1
XIRC	19.00	8.00	Xircom	12.00	-0.38	-3.0
XLGX	78.00	35.50	Xylogics Inc.	58.75	0.00	0.0
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AALR	9.63	3.75	Advanced Logic Research	6.63	0.75	12.8
AAPL	50.13	31.63	Apple Computer Inc.	32.75	1.00	3.1
ASTA	19.13	7.50	AST Research Inc.	8.50	0.00	0.0
CPQ	56.75	31.13	Compaq Computer Corp.	47.50	0.00	0.0
DELL	49.38	19.75	Dell Computer Corp.	32.88	-2.13	-6.1
GATE	37.50	16.00	Gateway 2000 Inc.	23.88	-2.50	-10.5
HWP	96.63	40.00	Hewlett Packard Co.	79.38	-4.25	-5.1
MUEI	29.88	7.50	Micron International Inc.	10.63	-0.25	-2.3
NIPNY	75.13	65.13	NEC America	62.50	1.50	2.5
SGI	45.63	25.13	Silicon Graphics (L)	24.63	-2.88	-10.5
SUNW	51.50	15.00	Sun Microsystems Inc.	41.25	-5.31	-11.4
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AMH	13.63	7.88	Amdahl Corp. (L)	7.88	-0.38	-4.5
CNX	8.13	3.63	Convex Computer	4.75	0.00	0.0
CYR	29.75	14.63	Cray Research Inc.	25.25	0.50	2.0
DGN	14.75	6.75	Data General Corp.	13.75	0.13	0.9
DEC	65.00	31.13	Digital Equipment Corp.	58.38	-5.25	-8.3
IBM	114.63	20.25	IBM	87.88	-2.38	-2.6
MDCD	12.75	3.00	Meridian Data Inc.	50.38	-0.50	-4.6
NETF	7.88	4.25	NetFrame	4.75	-0.38	-7.3
SQNT	25.38	13.75	Sequent Computer Sys.	13.88	-0.50	-3.5
SEQS	10.00	3.50	Sequoia Systems Inc.	5.50	0.00	0.0
SRA	50.88	23.00	Stratus Computer Inc.	32.88	-1.50	-4.4
TDM	19.75	10.00	Tandem Computers Inc.	10.50	-0.13	-1.2
TRCO	4.50	2.50	TriCord Systems	2.04	-0.08	-2.1
UIS	13.63	5.50	Unisys Corp.	6.13	0.50	8.9
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ADBE	74.25	27.75	Adobe Systems Inc.	41.38	-20.38	-33.0
AMSWA	8.75	3.50	American Software Inc.	6.38	0.25	4.1
APLX	20.75	6.25	Applix Inc.	25.50	1.50	-5.6
ARSW	48.50	31.75	Arbor Software	40.88	-5.11	-11.7
ACAD	51.88	25.25	Autodesk Inc.	34.88	0.00	0.0
BACH	10.75	3.50	Bachman Info. Systems (H)	9.00	-0.63	-6.5
BGSS	42.00	22.00	BGS Systems Inc.	37.00	0.00	0.0
BMCS	51.50	27.00	BMC Software Inc.	40.38	-2.50	-5.9
BOOL	26.38	17.13	Boole & Babbage	22.75	-1.25	-5.2
BORL	20.63	8.13	Borland Int'l Inc.	15.63	-0.63	-3.8
CESH	3.94	1.38	CE Software	2.13	-0.38	-15.0
CYE	27.88	12.38	Cheyenne Software Inc.	25.25	-3.00	-11.0
COGNF	45.63	16.00	Cognos Inc. (H)	42.88	-2.38	-5.2
CA	70.50	31.38	Computer Associates	64.38	-2.75	-4.0
CVN	15.50	3.63	Computervision Corp.	13.75	-1.75	11.7
CPWR	43.00	17.00	Compuware Corp.	17.00	-2.00	-10.5
CSRE	27.75	8.88	Comshare Inc. (H)	23.25	-3.25	-12.3
COSFF	19.50	10.13	Corel Corp.	10.88	1.13	-10.3
DWTI	16.75	8.00	Dataware Technologies Inc.	8.00	-0.25	-3.0
DSLGF	32.25	14.13	Discreet Logic Inc.	19.63	3.88	16.5
FILE	51.00	25.75	FileNet Corp.	44.50	2.50	-5.3
DDDDF	8.25	3.38	4th Dimension	4.50	0.13	2.8
FTPS	60.63	12.50	FTP Software Inc.	12.50	-16.50	-57.6
GSOF	26.00	8.50	Group 1 Software	9.00	0.00	0.0
GPTA	13.50	4.88	Gupta (L)	6.00	0.88	17.1
HOGN	13.88	4.63	Hogan Systems Inc.	12.63	-0.88	-6.3
HYSW	58.38	15.63	Hyperion Software Corp.	19.63	1.61	-7.6
IRIC	38.63	50.00	Information Resources	12.75	0.88	7.4
IFMX	34.38	14.63	Informix Corp.	29.60	-0.60	3.3
INGR	50.50	8.13	Intergraph Corp.	15.75	0.00	0.0
LEAF	12.63	2.88	Interleaf Inc.	9.13	-0.88	-8.8
ISLI	26.75	8.75	Intersolv Inc.	11.38	-0.75	-6.2
INTU	89.75	39.63	Intuit Inc.	66.75	-8.75	-11.6
MGICF	11.50	3.63	Magic Software Enterprises	9.00	1.63	22.0
MANU	30.50	7.50	Manugistics Group Inc.	11.75	-3.25	-21.7
MAPS	40.00	14.00	MapInfo Corp.	18.00	-6.00	-30.0
MATH	7.38	2.00	MathSoft	5.00	-0.83	-14.0
MCAF	52.88	30.13	McAfee Associates	36.25	-5.75	-13.7
MENT	27.88	12.38	Mentor Graphics	15.75	-2.38	-13.1
MIFGY	11.75	8.38	Micro Focus	8.50	0.13	1.5
MGXI	14.00	5.75	Micrografx Inc.	12.88	0.00	0.0
MSFT	109.25	58.25	Microsoft Corp.	87.13	-0.25	-0.3
ORCL	48.75	27.75	Oracle Corp.	41.63	-0.75	-1.8
PMTC	77.50	37.00	Parametric Technology	58.63	-7.88	-11.8
PARQ	22.25	6.63	ParcPlace Systems Inc.	9.13	1.00	12.3
PSFT	47.00	15.00	PeopleSoft	38.00	-3.50	-8.2
PTEC	66.13	6.13	Phoenix Technologies	14.50	-1.25	-7.8
PSQL	16.88	4.75	Platinum Software	4.75	-0.63	-11.6
PLAT	24.00	11.50	Platinum Technology	14.50	1.50	-9.1
PRGS	38.88	18.63	Progress Software Corp.	29.25	-8.50	-22.5
RNBO	26.75	13.63	Rainbow Technologies Inc.	25.13	-0.50	-2.3
ROSS	7.75	2.19	Ross Systems	2.81	-0.50	-15.3
SDTI	56.25	8.88	Security Dynamics Tech.	46.00	-7.75	-14.4
SOEV	51.75	20.38	Softkey International Inc.	22.94	-0.06	-0.3
SPCO	5.61	2.88	Software Publishing Corp.	3.25	0.11	3.7
SOTA	12.50	6.63	State of the Art	9.75	0.50	5.4
SSW	62.38	32.88	Sterling Software Inc. (H)	52.50	-8.88	-14.5
SDRC	30.50	5.13	Structural Dynamics Research	24.63	-4.75	-16.2
SYBS	55.00	19.88	Sybase Inc.	34.63	-1.19	3.3
SYMC	33.25	14.13	Symantec Corp.	17.00	-5.88	-25.7
SNPS	38.50	21.38	Synopsys	34.75	-2.38	-6.4
SSAX	30.63	10.38	System Software Assoc. (H)	20.00	1.38	6.4
SYSF	18.13	7.00	Systemsoft Corp.	12.00	0.50	3.2
TRUV	10.13	2.50	Truevision Corp.	5.06	-0.06	-1.2
VIEW	15.13	7.88	Viewlogic Systems	9.94	-0.06	-0.6
VMRK	31.50	5.75	VMark Software Inc.	8.69	-1.00	-10.9
WALK	8.25	4.63	Walker Interactive Systems	7.13	0.00	0.0
WALL	55.50	14.50	Wall Data Inc.	16.50	0.00	0.0
WANG	19.50	8.88	Wang Laboratories Inc.	16.13	-0.63	-3.7
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AMER	46.25	12.38	America On-Line	38.75	2.00	5.4
NETC	81.50	19.00	NetCom On-Line	35.00	-0.50	1.4
NSCP	174.00	45.75	Netscape Comm. Corp.	139.00	1.25	0.9
QDEK	38.50	2.75	Quarterdeck Corp.	22.13	-5.63	-20.3
SPYG	61.00	13.25	Spyglass Inc.	89.00	-12.00	-21.1
UUNT	98.75	21.75	UUNET Tech.	55.75	-7.00	-11.2
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AMD	30.25	16.13	Advanced Micro Devices (L)	17.13	0.88	5.4
ADI	26.38	13.38	Analog Devices Inc. (H)	22.50	1.00	4.6
CHPS	15.88	6.25	Chips and Technologies	8.00	-0.38	-4.1
CRUS	61.13	11.13	Cirrus Logic	20.50	-0.38	1.8
CY	27.75	10.75	Cypress Semiconductor Corp.	12.75	-0.38	-3.0
INTC	78.38	31.50	Intel Corp.	58.13	1.13	2.0
LSI	42.50	18.25	LSI Logic Corp.	29.88	-1.00	-3.1
LSCC	61.00	16.38	Lattice Semiconductor	33.63	1.25	3.9
MCRL	32.50	12.38	Micrel Semiconductor Inc.	16.50	3.25	16.5
MU	94.75	32.75	Micron Technology	40.88	0.88	2.2
MOT	82.50	51.50	Motorola Inc.	57.88	-0.13	-0.2
NSM	33.63	10.50	National Semiconductor	22.38	0.00	0.0
SERA	30.75	7.63	Sierra Semiconductor	14.50	1.25	9.4
TXN	83.75	37.75	Texas Instruments	49.63	-1.25	-2.5
VLSI	50.13	11.63	VLSI Technology	19.88	-1.88	10.6
WWTK	6.88	1.90	Weitek	3.13	-0.13	3.8
WDC	23.13	13.13	Western Digital Corp.	17.50	-0.25	1.4
XLNX	55.50	30.13	Xilinx	31.00	0.75	2.5
ZLG	54.13	28.50	Zilog Inc.	35.13	-1.63	-4.4
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APCC	25.88	8.13	American Power Conversion	9.88	0.50	5.3
ADPT	48.38	21.75	Adaptec Inc.	40.19	-0.88	-1.7
BTEC	22.75	14.75	Banctec Inc.	18.00	0.00	0.0
CBEX	13.13	5.38	Cambex Corp.	7.94	0.56	7.6
CGN	7.75	2.13	Cognitronics Corp.	6.38	-0.13	-1.9
CNR	24.00	8.75	Conner Peripherals	21.13	0.63	3.0
CREAF	34.50	8.88	Creative Technologies Inc.	9.25	0.63	7.2
RACE	13.13	3.63	Data Race Inc.	6.88	-0.63	-11.4
DTM	9.50	4.50	Dataram Corp.	6.06	-0.44	-6.7
EMC	27.50	13.00	EMC Corp.	16.00	0.63	4.1
EMLX	28.50	10.13	Emulex Corp.	10.38	0.25	2.5
ESCC	75.25	11.25	Evans & Sutherland	15.75	-0.50	-3.3
EXBT	25.63	10.00	Exabyte	14.50	-0.13	-0.9
IISLF	6.25	1.81	Intelligent Info. Systems	1.06	-0.06	5.5
IOMG	53.75	3.25	Iomega Corp.	47.50	-1.69	3.0
IPLSA	7.88	2.00	IPL Systems Inc.	3.13	0.00	0.0
KMAG	74.88	23.75	Komag Inc.	48.88	2.50	5.4
MXTR	7.25	3.00	Maxtor Corp.	6.63	0.00	0.0
MLIS	11.50	2.88	Micropolis Corp.	6.25	0.38	0.7
MTSI	49.25	11.50	Micro Touch Systems Inc. (L)	13.00	0.75	0.1
PEAK	54.75	14.75	Peak Technology Group	28.50	-2.75	-8.8
PNCL	19.75	5.88	Pinnacle Micro Inc.	14.25	-0.50	3.4
PTNX	38.75	13.50	Printronix Inc.	17.75	3.38	23.5
AQM	8.38	3.25	QMS Inc.	5.88	1.63	38.2
QNTM	28.50	11.75	Quantum Corp.	17.50	1.50	8.5
RDUS	15.00	1.88	Radius Inc. (L)	2.25	0.25	12.5
SEG	54.75	25.63	Seagate Technology	48.50	1.13	2.4
STK	31.25	17.88	Storage Technology	23.88	0.13	0.5
TEK	61.88	33.38	Tektronix Inc.	44.63	-4.13	-8.5
XRX	144.63	96.50	Xerox Corp.	133.75	-4.00	-2.9
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AMSY	31.75	14.50	American Mgmt. Systems	28.00	1.00	-5.3
ANLY	33.00	19.75	Analysts Int'l.	50.88	0.00	0.0
AUD	57.00	28.75	Auto Data Processing (H)	37.00	0.00	0.0
CATP	61.00	21.25	Cambridge Tech. Partners	53.00	-5.25	-8.2
CEN	42.50	26.13	Ceridian Corp.	40.75	-1.75	-4.2
CDO	23.75	14.75	Comdisco Inc.	21.63	-1.13	-4.9
CHRZ	40.00	8.88	Computer Horizons (H)	34.00	-4.00	-10.1
CSC	75.25	46.50	Computer Sciences	68.13	-2.25	-3.2
TSK	22.00	8.13	Computer Task Group	18.00	-0.75	3.8
CPU	46.38	14.75	CompUSA Inc.	31.88	0.50	1.6
CDAT	25.38	5.88	Control Data Systems Inc.	17.44	2.31	31.7
EGGS	14.75	5.75	Egghead Discount Software	6.13	-0.13	-2.0
GME	54.63	36.88	General Motors E (EDS) (H)	53.13	0.88	1.7
IMAC	15.25	7.00	Inacom Corp.	15.63	-0.38	0.5
IEIL	16.63	8.00	Intelligent Electronics	6.13	0.00	0.0
MSEL	8.50	3.88	Merisel	6.38	-0.13	-2.9
MCR	15.00	7.25	Microage Inc. (L)	8.50	0.50	6.5
PAYX	50.50	25.88	Paychex (H)	50.38	-1.25	-2.3
PMS	54.25	37.75	Policy Management Sys.	45.38	2.50	5.2
REY	39.43	22.88	Reynolds and Reynolds	38.88	-0.88	-2.3
SEIC	24.50	16.75	SEI Corp.	21.25	0.00	0.1
SMED	57.63	30.88	Shared Medical Systems	53.88	1.06	2.0
SMKIF	13.13	4.75	SHL Systemhouse	13.63	0.00	0.0
SSPE	26.50	14.00	Software Spectrum Inc.	10.88	1.00	4.0
SNDT	32.50	17.75	Sungard Data Systems	28.50	0.75	2.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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UB Networks takes Fast Ethernet plunge

By Bob Wallace

UB Networks, Inc. dived into the burgeoning 100M bit/sec. Ethernet market last week with the introduction of flexible Fast Ethernet adapters, stackable switches and a network management package.

The UB equipment lets customers protect their infrastructure investments by using existing Category 3, 4 and 5 unshielded twisted-pair wire.

Fast Ethernet is gaining popularity because it offers users 10 times the bandwidth of Ethernet LANs at roughly 1½ times the cost of current hardware. That popularity has been reflected lately in a spate of product announcements.

UB's new GeoStack/FE product is a 12-port, 100Base-T hub that can be stacked five high. One model supports Category 5 cable, and one supports Category 3, 4 and 5 wiring. The hub costs $2,995; a managed version costs $3,995.

Networking

Analysts say UB's prices are on the high side, however.

"3Com and Bay [Networks] are the market leaders from a price perspective, at around $200 a port," said Mary Petrosky, a senior analyst at The Burton Group, a Midvale, Utah, consultancy. "But at around $250 and $330 per port, they're in the mix, and Fast Ethernet still is a less expensive alternative to FDDI and ATM."

UB offers users an entry-priced model in the GeoStax/FE Micro, an eight-port unmanaged unit that costs $1,795. It offers Fast Ethernet adapters for Extended Industry Standard Architecture ($299) and for Peripheral Component Interconnect ($164).

UB also rolled out the GeoRim/E 10/100 Ethernet Switch, which was designed for workgroups and small backbone networks. It has 12 switched Ethernet ports for $5,995 and is available with a 100Base-T uplink for $7,690.

Firms can now use UB's NetDirector for Workgroups, a Windows-based Simple Network Management Protocol net management system to control the new products, as well as existing UB Ethernet and Token Ring hubs.

NetDirector for Workgroups is based on Hewlett-Packard Co.'s OpenView and costs $2,499.

In a separate development, UB said it has agreed to license Cisco Systems, Inc.'s Internetwork Operating System (IOS) software, which is akin to a PC operating system. IOS support will provide feature commonality across multiple internetworking devices.

Other IOS licensees include Cabletron Systems, Inc., Optical Data Systems, Inc., Cascade Communications Corp., Network Equipment Technologies, Inc. and U.S. Robotics, Inc.

Finding a cure for E-mail pains

CONTINUED FROM PAGE COVER 1

Roswell, Ga. He estimated that during the next couple of years, about 20% of corporate users may look to outsourcing.

"As companies get to the point of inundation by new technologies and outgrow old technologies, [they will] ponder outsourcing," the analyst noted. The stage is being set for this trend to pick up in the next 12 to 18 months, as all the major messaging vendors get ready to launch their products.

Yet Waverly Deutsch, a senior analyst at Forrester Research, Inc. in Cambridge, Mass., said it may be 1997 before the trend really takes off.

Outsourcing 101

Before an organization considers outsourcing, it should analyze in detail how its directory, network, and E-mail are set up, said Gary Rowe, principal at Rapport Communication. Companies should also consider what elements are handled locally and which need central administration. Access via X.400 or the Internet may be a central issue that can be outsourced, for example.

In a study of 50 Fortune 500 companies condacted in February 1995, Deutsch found that more than 80% weren't ready to outsource their mail. But much has changed since then, she noted. The emergence of the World Wide Web, the improvement in outsourcing services and the difficulty many companies have faced in installing their own switches are major factors likely to propel the movement to outsourcing.

The arrival of new messaging products will mean that users will have to redesign their infrastructure, so outsourcing may look all the more attractive.

As companies try to move from file-sharing to client/server architectures and from messaging-only to groupware applications, they will have to change the way their systems are set up.

Next on the list after the convenience of outsourcing is the potential to cut budgets and reduce staffing, users noted.

At Honeywell in Minneapolis, for example, project leader Tom Doyle manages corporate E-mail — about 35,000 accounts — with a staff of five. He has an outsourcing arrangement with Control Data Systems (CDS) in Arden Hills, Minn., to manage and troubleshoot the equipment for switching and directory synchronization. Doyle estimated that saves him from needing another seven to eight IS staffers.

Quick hit

Implementation is also extremely quick for E-mail outsourcing, said Kevin Rota, manager of office automation at Cushman & Wakefield in New York. Rota contracted with Infonet Services Corp. in El Segundo, Calif., in March 1995 to provide switching services between its 38 offices linked with point-to-point connections. Infonet started setting up the connections in June, and today all of Cushman's 1,800 users have E-mail.

"To stay state-of-the-art is very expensive," said Upendra Gupta, director of messaging services at Sprint International in Reston, Va. Sprint recently signed an agreement whereby it will both outsource from CDS and market its outsourcing services. "We need a group to evaluate and upgrade all the time. We will rely on CDS to stay state-of-the-art."

E-mail outsourcing also makes a lot of sense for companies that don't want to spend on capital assets, said Rik Drummond, president of the Drummond Group in Fort Worth, Texas. "Capital hits the bottom line harder because you have to factor it over several years," he said.

Will Oracle's InterOffice Suite be a winner? See page 43.

News Shorts

Pricing debuts for IBM Internet access service

IBM announced three pricing plans for IBM Internet Connection, a service that gives users access to the Internet through 350 local access points in the U.S. The Entry Plan has a $4.95 monthly charge and includes three free hours; each additional hour is $2.50. The Standard Plan carries a $12.95 monthly charge and includes 10 free hours, with each additional hour $1.95. The Comprehensive Plan is $29.95 a month with 30 free hours; additional hours are $1.95 each.

Platinum adds partner

Platinum Software Corp. in Irvine, Calif., last week said it will integrate **Abra Software, Inc.**'s payroll and human resources management software with its Platinum for Windows client/server accounting software. Abra, based in St. Petersburg, Fla., is offering current Platinum Payroll customers a $500 discount on the Abra Payroll migration software through Jan. 31.

Furloughed federal IS staff may bail out on Uncle Sam

The **Information Technology Association of America (ITAA)** last week warned that information systems professionals idled as a result of the partial government shutdown may soon seek new jobs, causing "an enormous loss" to the government and its IS contractors. ITAA President Harris N. Miller also warned that the development of badly needed new systems was suffering as a result of the shutdown. IS service contractors, as well as federal employees, should be compensated for lost wages when the shutdown ends, he added.

Electronic trading feud triggers exec ouster

The London Stock Exchange ousted its CEO, Michael Lawrence, following infighting over a controversial electronic trading scheme. Lawrence championed Sequence VI, a system designed for brokers to buy and sell orders at specific prices matched by a computer. But companies such as Merrill Lynch & Co., Barclays de Zoette Wedd and Swiss Bank Corp.'s SBC Warburg unit wanted to ensure that business in the most frequently traded stocks continued solely under the existing quote-driven system. The future of Sequence VI is unclear.

Microsoft to give away tool to link FoxPro to Internet

Microsoft Corp. later this month will begin giving away a tool for connecting FoxPro databases to the World Wide Web. The Visual FoxPro Internet Search Wizard takes a FoxPro database and generates a Web page that lets users query the data.

Probing 'Intranets' for holes

Qualix Group, Inc. in San Mateo, Calif., last week shipped a utility designed to seek out security holes and potential problems on TCP/IP and so-called intranet networks. The product, dabbed NetProbe, can be set up to continuously scan for intrusions, problems with new software installations and other security hazards. NetProbe runs on **Sun Microsystems, Inc.**, Sparc machines; prices start at $2,500, depending on network size.

SHORT TAKES Sales of mobile computers will more than double from $30 billion last year to nearly $80 billion by the year 2001, according to Mountain View, Calif. researcher **Frost & Sullivan**. ... Full-text archives of *The New York Times* are now available on the Dow Jones News/Retrieval subscription-based on-line service.

OS/2 has fighting chance as a server system

Charles Babcock

It's time to take another look at OS/2, despite everything you've heard about it having one foot in the grave.

IBM's LAN system, called LAN Server, soon will become part of OS/2 Warp. LAN Server quietly has been gaining strength: it has 15% of the LAN market and has been gaining mainly at the expense of Novell's NetWare, according to International Data Corp.

LAN Server will be merged with the existing version of OS/2, or Warp Connect, to form Warp Server in the first quarter of this year. Warp Server at that point becomes an integrated operating system that is capable of replacing NetWare and competing with Windows NT. It also can do a few more things, such as function as a database server or Lotus Notes server.

Warp Server warrants a second look because OS/2's greatest strengths lie on its server side, where IBM's operating system experience invested it with high availability and scalability. OS/2 always was more viable as a server than a client, but those marketing geniuses at IBM have pushed the client side in their Warp campaign.

A beefed-up, repackaged Warp Server provides a second chance for OS/2 for the following reasons:

- IBM is integrating Directory Security Services and Kerberos security into Warp Server, clearing a user with a valid password to access many resources of a given cell or region with one logon. The feature has been in beta testing since October and is due to be added by the middle of this year. The addition will enable Warp Server to match NetWare's Network Directory Services.
- Full Distributed Computing Environment (DCE) support will go into Warp Server, according to Sandra Carter, product manager for distributed systems at IBM in Austin, Texas. DCE libraries in Warp will make it possible to develop distributed applications more readily because DCE-enabled software can navigate across operating systems and hardware platforms.
- Object development is increasingly important to distributed systems. IBM and Sun Microsystems are the leading innovators for objects in large systems. Warp supports IBM's System Object Model, which underlies the Common Object Request Broker Architecture standard, Smalltalk and C++.
- Btrieve will be available on Warp Server by the middle of this year, according to John Soyring, director of strategic relations at IBM's Personal Software Products Division. The database engine from Btrieve Technologies, Inc. in Austin frequently is built in to applications from independent software developers and will make it easier for them to port applications to OS/2. More small business applications could become available through this move. OS/2 supports Oracle, Sybase, Ingres and DB2 databases, but Btrieve will fill out the database picture. While sales of file and print servers are flattening, database servers will make up a growing share of the 2.2 million PC servers expected to be sold this year.
- OS/2 already runs more than 85% of Notes hosts, according to Gartner Group, Inc. Now that IBM owns Lotus, it has an engine for generating continued OS/2 use. Lou Gerstner was wrong. IBM's purchase of Lotus had a lot to do with OS/2, despite statements to the contrary.

OS/2 always was more viable as a server, but those marketing geniuses at IBM have pushed the client side.

Nor would I write off OS/2 as a client. IBM is pushing hard its development of the end-user interface, with ambitious plans to add voice activation and better windows than Microsoft Windows.

"Merlin [the next version of the OS/2 user interface, due in the middle of this year] will keep the rectangular window but will support irregular-shaped objects. It also will provide translucency, a [three-dimensional] effect of seeing the closed Windows behind the one you're working in," according to Soyring.

The continued influx of PCs means many sites are buying servers — a lot more servers. An estimated 3 million will be sold in 1998.

IBM's chief accomplishment with OS/2 thus far has been to convince the world that it can't sell a PC operating system or that it is confused about how it wants to do so. That's because IBM has been jealously focused on the desktop, while its natural strengths lie on the server side.

It may be whistling past the graveyard, but I think IBM has one last chance to win acceptance for an impressive server package. And the market is growing so fast that it just may have assembled the right stuff to accomplish something there.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

Inside Lines

Lotusphere scalpers?

Well, it seems the management company that Lotus hired to handle registrations for Lotusphere '96 this month in Orlando, Fla., didn't keep very good track. Complaints are surfacing from people who sent in their registration and planned their trips — and even bought non-refundable airline tickets — only to learn that they are on a waiting list and that the conference actually sold out in November. To quote Homer Simpson: "Doh!" A Notes developer posting on the Internet groupware forum actually offered to develop a "small to medium-size Notes or HTML applet in return for information leading to me getting a ticket." Lotus officials said those on the waiting list would be registered if space became available.

And the first shall be last?

IBM may have led the way in promising to give mainframe users the ability to stack multiple data sets on a single tape cartridge. But delays on the mainframe version of its Magstar drive created a vacuum that Memorex Telex may be the first to fill. According to sources, Memorex Telex hopes to ship a so-called "volume stacking" capability for its Sultan tape library around midyear. Magstar isn't expected to support stacking until 1997.

Beam us all up, Scotty!

Zenith Data Systems is kicking off the new year with a unique offering: a wireless multitasking enterprise product for campuswide and local remote workers. The product, which will include hardware and software, will be announced next week. It will give users access to multiple, concurrent Windows NT sessions on a single server.

Let it snow, let it snow

The new year's winter storms last week snarled travel on highways and through airports, but they also jammed traffic on many information highways. Telephone services reported heavy use by telecommuters, which resulted in clogged circuits. Network managers at Eli Lilly saw a huge jump in Internet gateway activity, according to monitoring tools that track user connections. "We could see them hit radar sites on the World Wide Web to watch the blizzards come across Indiana," said Tom Reinsel, a team leader in the network management systems group at Eli Lilly in Indianapolis.

The 5th Wave by Rich Tennant

"I did this report with the help of a satellite view, atmospheric map from the National Weather Service, research text from the Jet Propulsion Laboratory and a sound file from 'The Barking Lumpkins' new CD."

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You gotta hand it to Southern California, where beepers are a fashion statement and you can find cellular telephones in the john. In an effort to draw tenants, a large apartment complex in Anaheim, Calif., recently started to offer new commercial and residential renters 10 hours of free Internet access along with their leases. Newbies can even get free 'net surfing lessons. The idea came from Adman Internet Marketing in Anaheim. The firm claims that the free 'net access offer helped fill 30% of the apartment site's vacancies in the first two weeks.

Microsoft and Compaq are co-sponsoring an educational sitcom series that made its debut last Friday to hundreds of millions of viewers in China. In the first episode, the father goes to America and blows the family's entire savings on a PC (it must have been a Windows 95 machine). The comedy is supposed to be educational: You know, how smart it is to spend all your money and have nothing to show for it but the ability to cruise the Internet. A regular "Our Gang" for the 90s. . . . So if any educational ideas or news tips come your way, do get in touch with Computerworld *via our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by telephone at (508) 820-8179 or via the Internet at maryfran_johnson@cw.com.*

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